CANADIAN GEOGRAPHICAL JOURNAL

MAY
1938

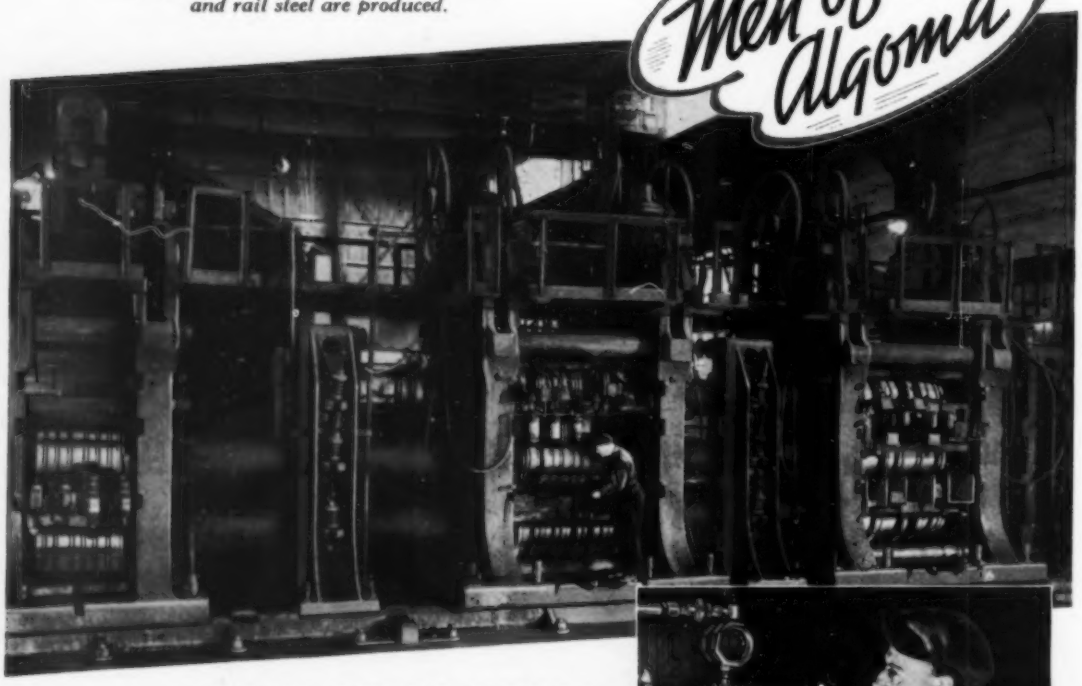
VOL. XVI
NO. 5

35c A COPY

$3.00 A YEAR

● *Algoma's 30" Rail and Structural Mill on which large tonnages of Canada's structural and rail steel are produced.*

Men of Algoma



. . . NOW AT ALGOMA CANADA ROLLS HER OWN

IN 1902 ALGOMA STEEL started making rails. Steel shapes and sections for Canadian industry were imported. Spurred by the opportunities for the employment of Canadian labour, capital, services and resources presented by this expenditure of millions of dollars outside Canada every year, Algoma Steel has steadily diversified its steel production.

Now, at Algoma, Canada rolls her own structural beams and channels up to 15" web depth . . . bars and light sections . . . reinforcing steel . . . centre sill zee bars for railway cars . . . steel sheet piling . . . billets for forging and further processing . . . carbon and alloy steels in 130 grades.

Since 1935 the "Men of Algoma" have added fifteen heavy steel shapes *never before made in Canada* to the produced-at-Algoma line.

Today steel from Algoma is used not only for rails and railroads but for buildings, bridges, docks and drainage structures, automobiles, machinery, mining equipment and other products and utilities used by millions of Canadians every day.

TOM McCRACKEN

Veteran roller in the Algoma Rail and Structural Mill.

ALGOMA STEEL CORPORATION, LIMITED

Montreal—SAULT STE. MARIE—Toronto B.C. Agents: F. Drexel Co., Vancouver

In addition to stocks maintained at the mill, Algoma structural sections are carried in quantity by Canadian fabricators.

ALGOMA STEEL

CANADIAN GEOGRAPHICAL JOURNAL

Editor - Gordon M. Dallyn

172 WELLINGTON STREET, OTTAWA

This magazine is dedicated to the interpretation, in authentic and popular form, with extensive illustration of geography in its widest sense, first of Canada, then of the rest of the British Commonwealth, and other parts of the world in which Canada has special interest.

Contents

MAY, 1938 VOLUME XVI No. 5

COVER SUBJECT:—*"Skip hoist" of blast furnace in Hamilton, Ontario, of The Steel Company of Canada, Limited. There are ten such furnaces in Canada, capable of producing 1,515,000 tons of pig iron per annum. One of these is at Port Colborne, Ontario, two in Hamilton, three in Sydney, Nova Scotia, and four at Sault Ste. Marie, Ontario.*

PAGE

THE STEEL INDUSTRY OF CANADA, by DESMOND KILLIKELLY . . 213

HUNGARY, by DOMINIC C. DE SZENT-IVANYI 247

PRINCE EDWARD ISLAND, by FRANK WALKER 255

EDITOR'S NOTE BOOK V

BOOK REVIEW . . . . . V-XI

• • • •

The British standard of spelling is adopted substantially as used by the Dominion Government and taught in most Canadian schools, the precise authority being the Oxford Dictionary as edited in 1929.

Contents of this Journal are copyright.

The Canadian Geographical Journal is printed in Canada by the Canadian Printing and Lithographing Company, Limited, Montreal, for the proprietors, The Canadian Geographical Society, and published by the Society at 2151 Ontario Street East, Montreal, Canada.

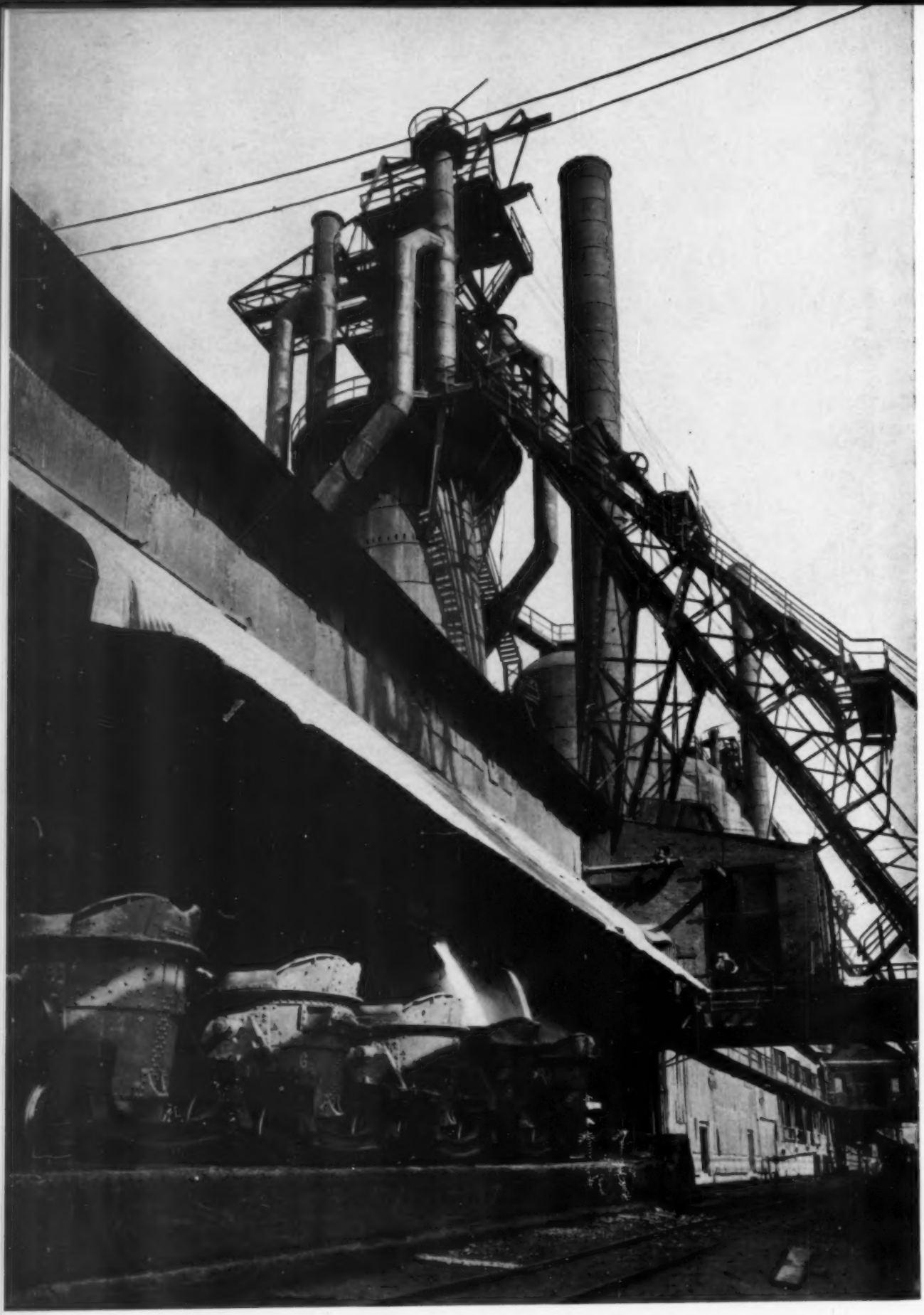
Address all communications regarding change of address, non-delivery of Journal, etc., to the publication office, 2151 Ontario Street, East, Montreal, Canada, giving old and new address. On all new memberships, the expiry date will be printed on wrapper containing starting number. This will constitute a receipt for subscription.

Member Audit Bureau of Circulations.

Membership fee is $3.00 per year in Canada and other parts of the British Empire, which includes delivery of the Journal, postpaid; in United States, Mexico, France, Spain, Central and South America, $3.50; in other countries, $4.00. Make membership fee payable at par in Ottawa.

Sole Trade Agents for the British Isles: George Philip & Son, Ltd., 32 Fleet Street, London, E.C. 4.

Entered as second-class matter at the Post Office, Montreal, Canada.



Casting time at No. 4 blast furnace of the Algoma Steel Corporation.

THE STEEL INDUSTRY OF CANADA

by DESMOND KILLIKELLY

THE importance of the steel industry in Canada cannot be over-estimated. It is by no means an exaggeration of its importance to consider the steel industry as the basal stone in the economic structure of Canada's manufacturing activities. In the United States of America it is regarded as a sensitive "barometer of capital goods activity." To quote a leading American periodical "when capital goods are selling in satisfactory volume, the steel business is good. When it is not good, you may be sure there is a lessened demand for capital goods." This is equally true in Canada.

It is stating a truth to say that steel is both omnipresent and ubiquitous, despite the synonymic relationship of the terms. From the humble pin in the pin-cushion on "my lady's" dressing-table to the giant members of massive bridges, fortifications and other structures, steel accompanies us as a necessary and inescapable companion in our journey through life. It is an indispensable factor in the creative industries of mankind the world over: in the food we eat, the clothes we wear, the homes which shelter us, and humanity's daily activities in work or play, steel, in one or other of its multifarious forms and uses, has played its part. "The Age of Steel" has a literal meaning, and refinements in the manufacture of its products are adapting it to more and more varied uses as time passes.

The industrial progress made in modern times by Great Britain, the United States of America, Germany, France, and other countries, has been based to a large extent upon the development of their iron and steel manufacture. It may be regarded, therefore, as axiomatic to say that any country which has built up a healthy steel industry within its borders, has made its most important contribution towards progress in peace, and security in war.

In the field of research, chemists and metallurgists strive for new and better products in their probe for the solution of steel problems. It is a constant quest of the unknown, for the potentialities of steel appear to be limitless. The employment of labour and other services necessary for the production, processing, transportation of raw material to plants and, of finished products out of plants for distribution to consumers; the development of talent; the creation of new wealth and purchasing power for Canadians, and the happy relationships of labour in intimate concord with managements of the steel industry in Canada, all tend to nationally beneficial results.

Canadian Native Iron Ores

The most important and essential factor in the development of an iron and steel industry is an easily available and plentiful supply of good quality iron ore. While native ores were used exclusively in the early stages of the iron industry in Canada, the situation at the present time presents the anomaly of a country possessing large deposits of ore, and yet importing most of its requirements of this raw material. In 1924, reserves of iron ore in Canada were estimated at over 400 million tons—sufficient to last over 200 years, if utilized at the present rate of consumption. In 1920, the National Research Council formed a committee to investigate the iron mining situation in Canada. The final report of the committee ("on the utilization of the low grade iron ores of Canada") was published in 1924. The report indicates that quality and location are the principal hindrances to a successful exploitation of native ores at the present time.

The quality of the more accessible ores showed, from tests, that properly prepared Canadian ores would be entirely satisfactory for blast furnace operation, but the cost of treatment to which they must first be subjected before they could be satisfactorily utilized, and the high cost of transportation of the more inaccessible ores, from mine to furnace, render their use economically prohibitive at the present time. The report concludes (in part):—

> "It is impractical to discontinue the importation of foreign ores while these can be obtained much more cheaply than our own ores can be mined and beneficated; but it does seem advisable that we should be making progress with the development of our own resources. It is to ensure that such

progress be made that we recommend the giving of sufficient assistance to encourage attempts to make iron mining in Canada successful. In our opinion, a bounty of fifty to seventy cents per ton of merchantable ore or concentrate would encourage operators to proceed with attempts to utilize Canadian Iron Ore."

To-date, however, no bounty has been offered by the federal Government, but in 1924 the government of the Province of Ontario offered a bounty of half-a-cent per each unit of metallic iron per ton of ore mined in the province (a unit representing 1 per cent of metallic iron contained in a ton of ore, and usually found to average between 40 and 50 per cent.)

In 1930 the amount of the bounty offered was increased to one cent per unit, and in 1937 it was further increased to two cents per unit, the act being then proclaimed to become operative for a period of ten years from January 1, 1939. Some preparations have been started for mining operations in the Michipicoten area in Ontario, where the deposit of iron ore is estimated at about one hundred million tons.

It is worth noting in addition that in 1894 the Ontario Government established an Iron Mining Fund of $125,000, which was exhausted in 1905 by the payment of $1.00 per ton on pig iron produced in Ontario from Ontario ores.

Importations of Iron Ores

While the quest for suitable native ore continues, Canada depends upon ores mined in the Lake Superior district of the United States, and the deposits in Wabana, Newfoundland, for its supply. This fact has given rise to criticisms from those who subscribe to the economic theory that industrial development in any country should confine itself solely to those industries for which the required raw material is entirely indigenous. Whatever force of economic logic might have been applicable, in such a theory, to the steel industry in Canada in years past, has long since been effectively dissipated. The steel industry has reached the stage wherein the demand from the engineering activities of the Dominion for alloy steels of a highly specialized nature is ever increasing, and no one country in the world possesses, in its native resources, all the elements required for the manufacture of these high-grade steels.

Even the great steel industry of the United States of America can no longer claim for itself independence from all exterritorial sources of supply. In a recent bulletin by the American Iron and Steel Institute, it is stated that 57 of the 92 known chemical elements are used in steel mills, directly or indirectly, in the production of steel. The wonders wrought in the past five or ten years show results of new applications of available materials in new combinations, and the term "tailormade steel" is well applied to the modern product. Steel making has therefore developed an international flavour of an interdependent character.

Scrap Iron and Steel Consumption

Wherever iron or steel is produced, fabricated, or put to final use in finished form, scrap will be found as a result of manufacturing operations on the one hand, and by reason of age, wearing or obsolescence on the other. This scrap becomes a valuable agent as raw material and is almost universally returned to the furnace and thus virtually remains in circulation. Its importance may be judged from the data obtained in a study of operations relating to the steel industry, compiled by John Casey, statistician, Bureau of Mines, Department of Mines and Resources, Ottawa. For the years 1927 to 1936, inclusive, furnace charges on the average have consisted of 52.43 per cent of scrap metal, varying slightly from year to year, the smallest proportion having been used in 1927, 45.4 per cent; and the greatest in 1932, 69.7 per cent.

The varieties of scrap are as varied as the uses to which iron and steel are put, and are known to the industry under such classifications as plant scrap, railway scrap, marine scrap, mill scrap and country scrap from junk yards. While there is statistical data showing the amount of plant scrap and purchased scrap, re-charged to furnaces of primary steel producers annually (average 553,560 short tons 1927 to 1936 inclusive), no statistics are available to show the amount produced and circulated annually in the secondary steel industries.

The value of scrap as raw material for furnace use is governed by many factors involving cost of accumulation, cost of sorting and cost of delivery as the leading items, as well as by many ramifications of

the scrap business which reach across the entire Dominion in periods of high or low prices.

Exports of iron and steel scrap from Canada, for the first ten months of the calendar year 1937, show a decrease of 30 per cent in weight, and of 2.6 per cent in value over the corresponding period in 1936. This decrease may be due in part to an increase in demand for scrap in Canada, and in part to a decrease in available supplies, or to a partial exhaustion of the sources of supply. Whatever the cause or causes of the decrease, the export of scrap from Canada to foreign countries is of the gravest importance to our steel industry, and, verily, to the Dominion of Canada, in all its far reaching implications.

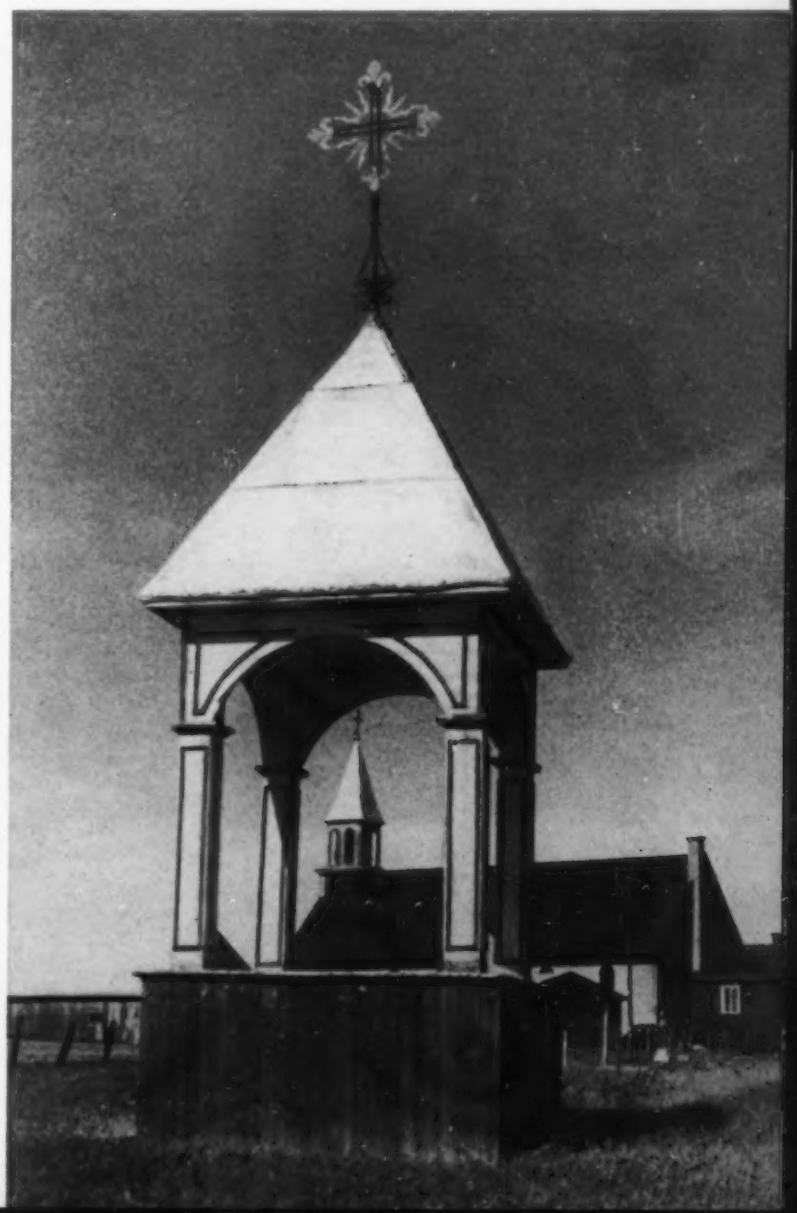
Government Aid Given to the Industry.

The protective system in Canada, whether it be through customs tariff, or other forms of subsidies, was adopted to promote the establishment of a diversified structure of primary and secondary industries with a wide range of opportunities. There are, therefore, few industries in Canada that have not received such aid in one form or another. The whole economic development of Canada has been largely the result of what has been termed "interferences with the normal course of economic theory" directed to the stimulation of activities at home.

The protective policy, otherwise known as the "National Policy," adopted in Canada in 1879, was largely the result of changes of trade policies, first of the United Kingdom, and later of the Unites States, which created difficulties for Canada in marketing raw products profitably abroad. The small Canadian population of that time had built up an industrial and commercial structure based upon the export of primary products in return for imports of manufactured goods, and the sudden loss of those markets, the instability of tariff concessions obtained from others, and the drain of Canadian population to the more industrialized areas of the United States, called for a national policy for the encouragement and development of home industries, and a home market.

This policy has continued to be supported by both of the major political parties in Canada, though varying in degree with changing governments and

Cross showing the fleur-de-lis at the head, foot, and each arm, and reputed to have been forged at "Les Forges de St. Maurice" during the French regime in Canada, stood for many years at the peak of the spire of the old Catholic Church at St. Maurice. Today it stands at the top of a special tower erected at the entrance to the cemetery at St. Maurice, a symbolic guardian of a dead past in a notable industrial era of old French Canada.



Ruins of "Les Forges de St. Maurice," indicating the gable end of the "main house" or residence of the manager. Here were received in state the Intendent and later the English Governors of Lower Canada.

Site of "Les Forges de St. Maurice," where the first iron foundries in Canada were established, as it now appears. A hive of activity two hundred years ago, this is now a quiet pastoral scene.

personnel. Whether protection is applied by means of customs tariffs, tax exemptions, bonuses, or other means designed to encourage, and develop industry in Canada, the principle remains the same, and Canada has profited thereby.

A striking example of the recognition of the importance of building up a steel industry in Canada was the bounties paid on the production of pig iron, and the assistance given in regard to coke, by the Laurier Government, of which the Right Hon. W. S. Fielding was Finance Minister for many years. Mr. Fielding was well-known as a staunch "free-trader," in theory, and might have been justly suspected of subscribing to the economic theory of developing only those industries which would be entirely indigenous to the country, but his high sense of practical values, in the adjustment of economic theories to meet economic realities, and his interest in the development of his country, evidently overcame any academic theories he might have held in his school of economics.

To the extent that protective tariffs, apart from their protective aspect, foster industry within the country, they become indirect revenue producers through the taxation which falls upon that industry. The steel industry is one of the important key industries in a chain of interdependent industries. By its successful development and expansion, a prolific source of taxation is created for Governments, federal, provincial and municipal.

Historical Background

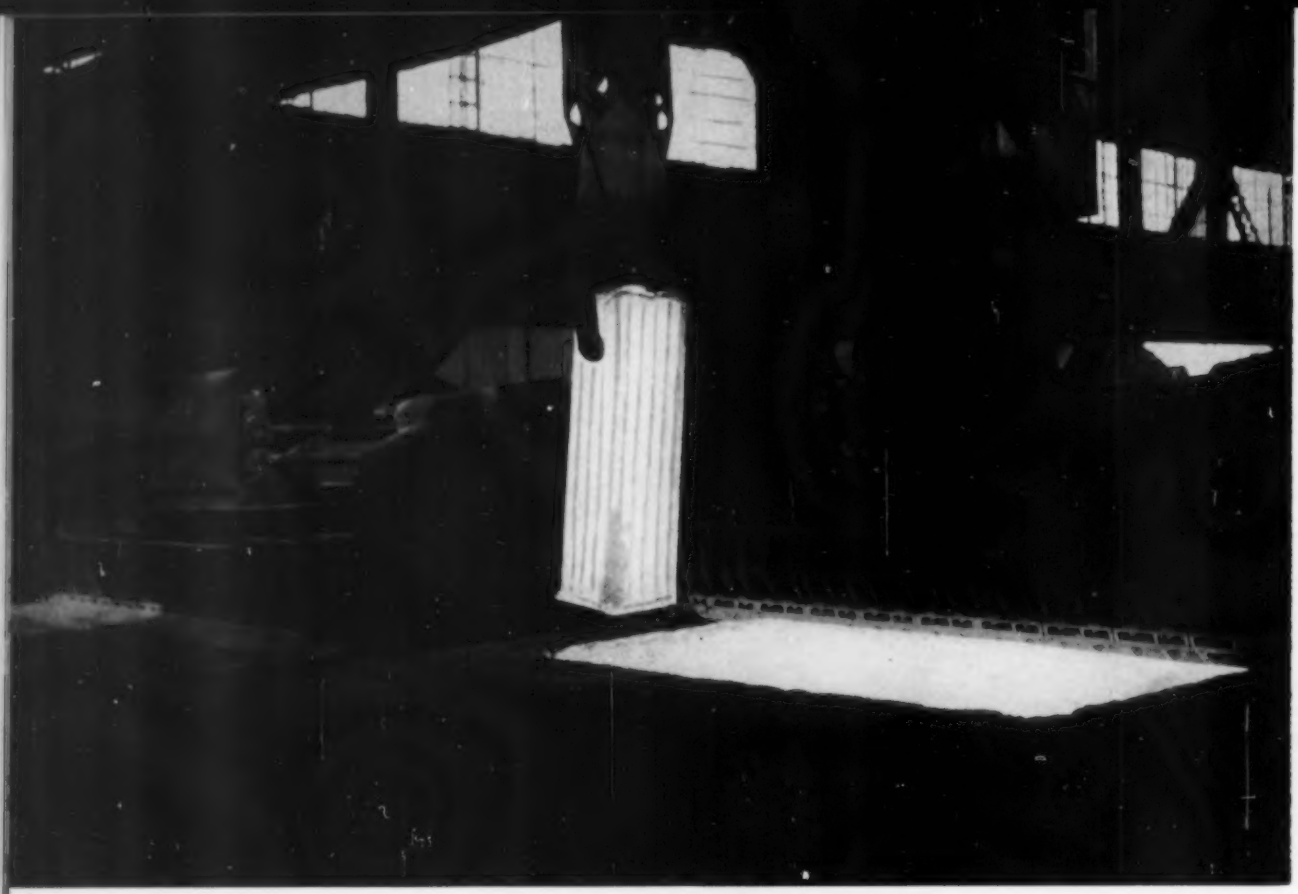
Steel is an alloy of iron, and its historical background, in Canada, as in any other country, is the history of the iron industry.

The first historical mention of iron is in the biblical book of Genesis, where we read that Tubal Cain, the sixth in descent from Adam, was "an artificer in iron." There is also no doubt that the working and hardening of iron was a common cult 3,000 years ago, and it is mentioned several times in the writings of Homer. As the years rolled on, improvements in methods of production grew slowly but surely. About the year 1350 A.D., German iron workers discovered ways of reducing the iron from the ore into a liquid state that could be "cast" into moulds, and thus was born the embryo of steel making which was to reach fruition many years later.

RIGHT:—Chimney of the old smith's forge in "Les Forges de St-Maurice," north of what is now known as Three Rivers, Que.

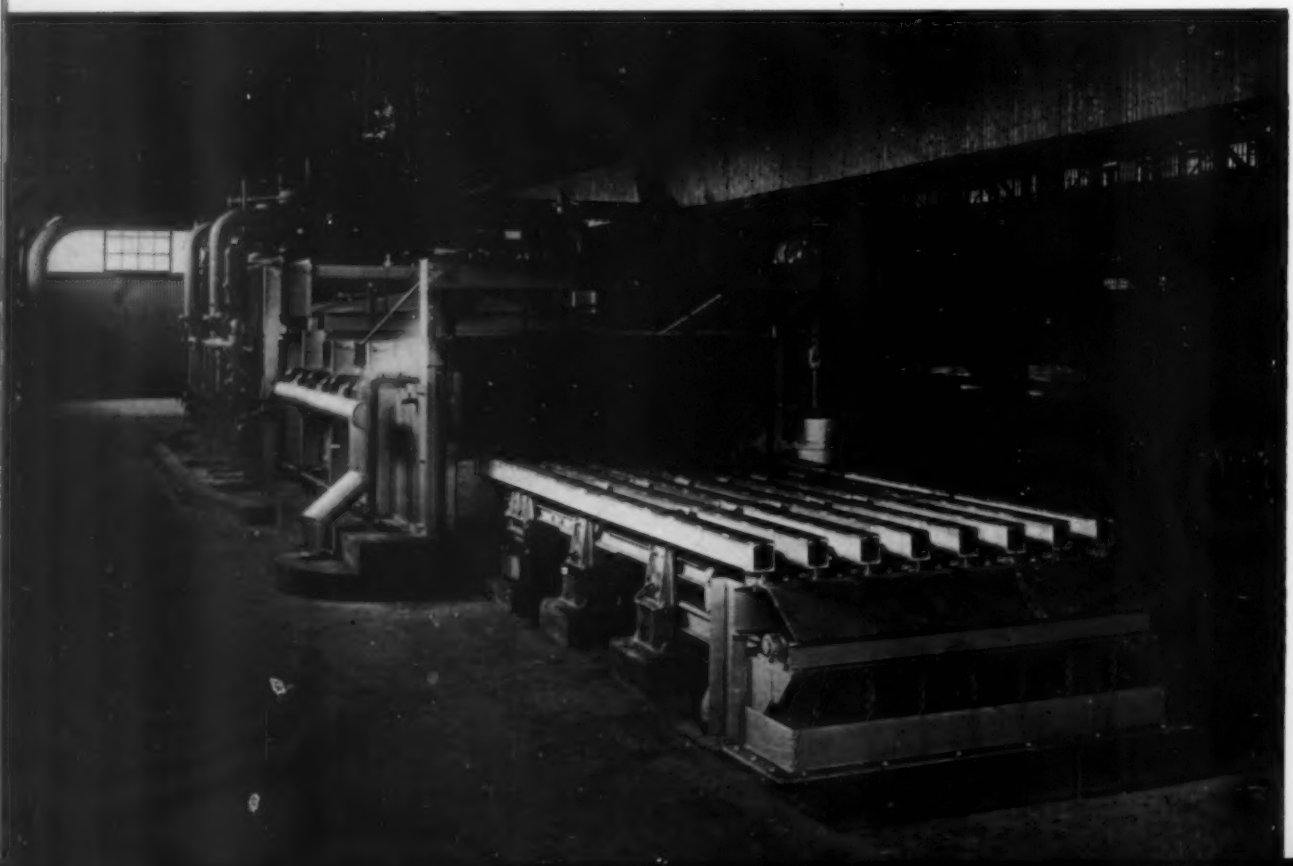
DONNACONA

Dock at Sault Ste. Marie, Ontario, of the Algoma Steel Corporation, where facilities are available for the rapid discharge of coal from large lake steamers.

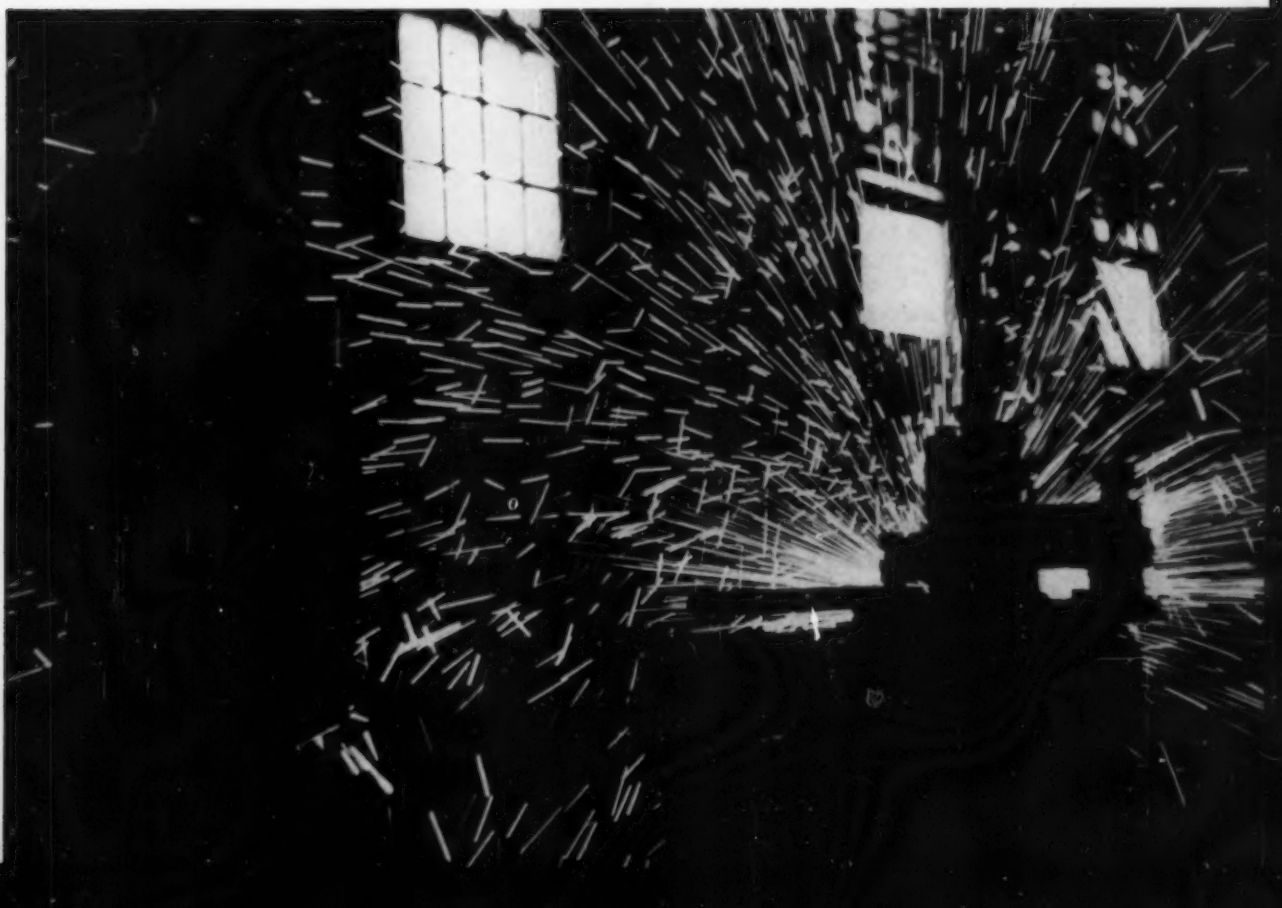


Steel ingot of approximately seven tons being drawn from a "soaking pit," where a uniform temperature suitable for subsequent rolling has been attained.

Annealing furnace at the Hamilton Works of The Steel Company of Canada, where sheets are tempered to the required degree of hardness for further manufacture.



Pipe Mill operations in the St. Henri Works, Montreal, of The Steel Company of Canada, whose annual capacity is 22,000 tons of butt-weld pipe. (ABOVE)—Fabrication of butt-weld pipe from steel strips (skelp), which are drawn through a bell-shaped die that welds the edges together. (BELOW)—Sawing off pipe ends.



A partly wooded farm on the banks of the St. Maurice River, in the province of Quebec, marks the cradle of the iron industry in Canada. Viewing this quiet and peaceful pastoral landscape of to-day, it is hard to realize that it was the site of intense industrial activity for a period of over 150 years. Its history actually reaches back to the year 1660, twenty-four years after the founding of Montreal, when Talon, then the Intendent of New France, was ordered by the government in Paris to organize and carry out a search for iron ore, and to investigate the possibilities of establishing a forge to smelt the ore to profitable advantage. This official interest stirred the imagination and enthusiasm of the colonists. Iron ore was first discovered at the mouth of the St. Maurice River, but this was not found to be of suitable quality.

Deposits of a more compact character were later discovered further up the river, and in 1670 Comte de Frontenac visited the site and made a favourable report to the government in Paris. In 1730 Mons. de Francheville erected the first forges, but through lack of experienced help the enterprise failed. In 1736 a new attempt was made, and "Les Forges de St-Maurice" were established with the aid of a subsidy of 10,000 livres from the King of France, claiming neither rent nor taxes from those who were privileged to exploit this new field of industry. Through lack of capital, however, and lack of skill in the art of smelting, the enterprise suffered a second failure, and, in 1743 the crown took possession of the plant and carried on its operations in the name of the King, and for his account. Skilled workmen were brought over from France and Sweden to improve the furnace, rebuilding it, in part at least. Over the arch of the furnace, a plaque was placed bearing the insignia of France, the fleur-de-lis, and the date 1752. This plaque, bearing the scars of the fires of the industry, now in the possession of the authorities of the Catholic Seminary at Three Rivers, Que., is an historic relic of French-Canadian industry in the Province of Quebec in those early years.

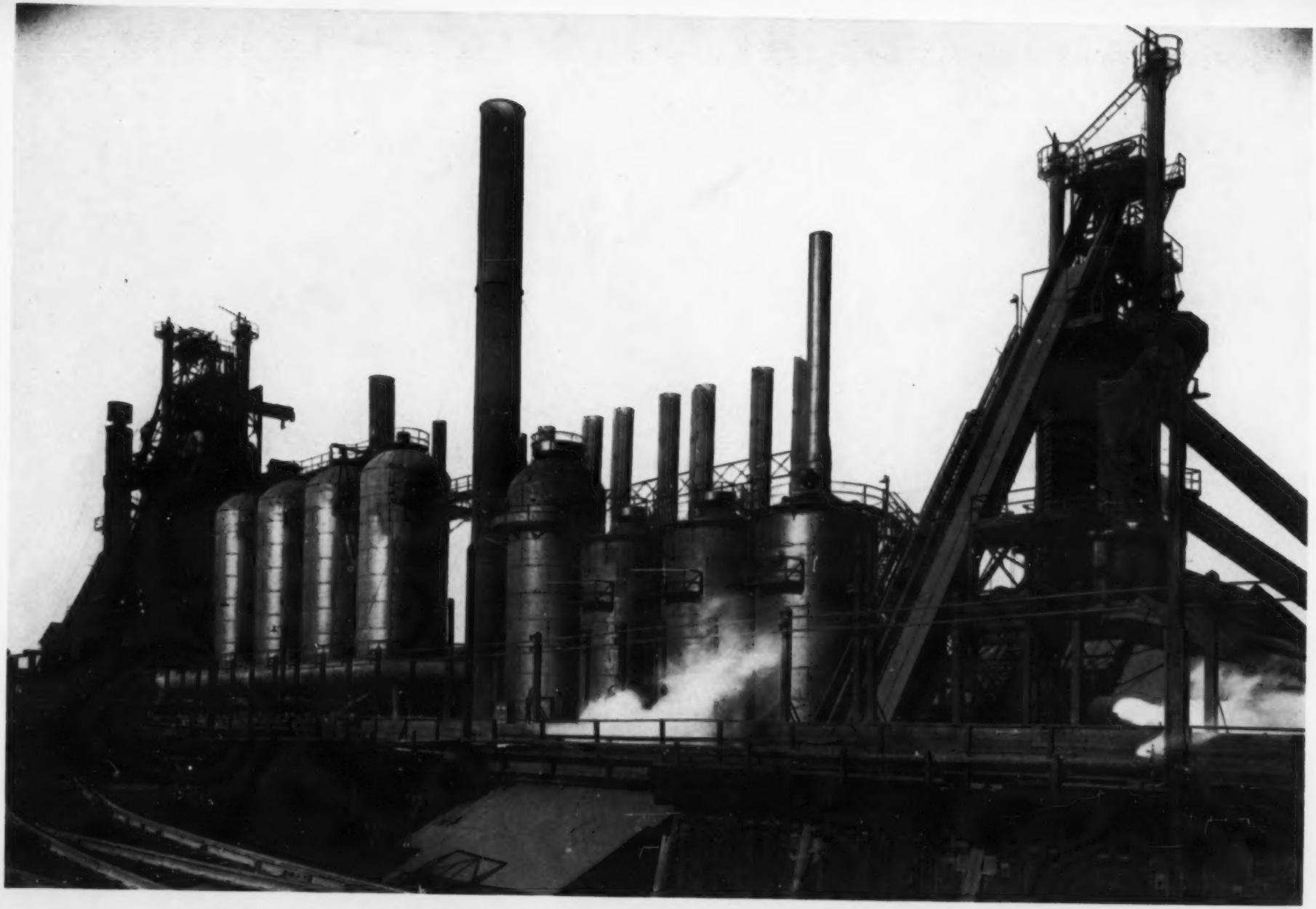
A wealth of romance and legend surround "Les Forges de St-Maurice" woven into the history of its vicissitudes during their long years of operations.

Despite the most favourable conditions for profitable operation, the revenues did not meet expenses, and the King was called upon for more and more advances of money for maintenance. Many plausible reasons were advanced to explain the circumstances, such as the lack of population, and that the few inhabitants of the country had enough to do in their agricultural pursuits, and that "it therefore cost great trouble, and large sums, to get a sufficient number of workmen."

In 1747, one Professor Peter Kalm, Professor of Economy in the University of Aoba, in Swedish Finland, and a member of the Swedish Royal Academy of Sciences, visited "Les Forges de St-Maurice" during his travels through Canada, and in a written account of his visit, after a thorough investigation of all its working, he expressed surprise on hearing that the enterprise was unprofitable. "The iron is good," he wrote, "and can be easily and cheaply dispersed over the country. This is, moreover, the only iron works in the country, from which everybody must supply himself with iron tools, and what other iron he wants." He then naively adds, with some shaded suspicion, "the officers and servants, belonging to this iron works, appear to be in very affluent circumstances."

There seems to be no doubt that the suspicion of "graft," hinted at by Professor Kalm, existed in this, and other government occupations. Documents relating to the times show that many complaints were dispatched to France touching on the ruinous state of affairs being produced by the officials of the Province. An historic matter of interest concerning "Les Forges de St. Maurice" and the suspicions of Professor Kalm is found in the romantic incident that "Les Forges de St. Maurice" are mentioned in the articles of capitulation between Major-General Amherst, Commander-in-Chief of His Britannic Majesty's troops in North America, on the one part, and the Marquis de Vaudreuil, Governor for the King in Canada, on the other part. These articles were dated September 8th, 1760. Article 44 says:—

> "The papers of the Intendency, of the Officers of Comptroller of the Marine, of the ancient and new treasures of the King's magazines, of the officers of the revenue, and *forges of St. Maurice*, shall remain in the power of M. Bigot, the Intendent, and shall be embarked for France in the same vessel with



Two blast furnaces of The Steel Company of Canada, Hamilton, with a capacity of 340,000 tons of pig iron per annum.

him. These papers shall not be examined."

M. Bigot sailed for France, unwittingly bearing his own "death warrant," for on his arrival there he was seized, imprisoned, and made to disgorge most of his ill-gotten gains.

Another incident of historical interest connected with "Les Forges" may be mentioned in the fact that in 1775, during the American invasion, one Pellisier, one of the lessees of the plant, aided and abetted the Americans with both goods and money, and further, cast shot and shell to be used by them in their seige of Quebec. He finally absconded, by way of Sorel, to the United States, carrying with him all the funds belonging to "Les Forges," and also all the vouchers given for money advanced to the Americans, amounting to about two thousand pounds. His American friends cashed these vouchers after which he sailed for France, leaving his co-lessees in the company practically insolvent. Several interesting and amusing legends cluster about the old Forges at St. Maurice; the origin of most of which are found in the dispute which arose between a Mr. Bell, the proprietor of the Forges, and a Miss Poulin, of Three Rivers. These legends are related by C. A. Duclos, B.A., B.C.L., in his translation from the French of M. L'Abbé Caron, of Three Rivers, as follows—

"Miss Poulin was the owner of land covered with fine maples, and Mr. Bell continued to cut these for charcoal. She naturally resisted this invasion and several lawsuits between the parties were the consequence, in which Miss Poulin appears to have been usually worsted. She was not among the most devout, and being finally exasperated beyond endurance declared that since she could not enjoy her own property she would give the whole of it to the devil, and on her death-bed refused to make a will, still declaring that she instituted his satanic majesty her universal legatee, adding that she hoped the thieves who robbed her during her lifetime would not enjoy their stolen property in peace.

"The devil seems to have taken this donation seriously, and from the moment of Miss Poulin's death took possession as owner not only of her property but even of the Forges itself.

"Among the many legends which this supernatural possession gave rise to, the following may be cited as of special interest:—

"Every day a mysterious stranger, whose features could not be distinguished, who neither spoke nor answered when spoken to, of doubtful colour, was seen walking about the Forges, with paper and pencil, apparently taking note of all that was going on. Leading to the Forges was a long road, called "La Vente-au-diable," as it is still called. This was precisely on the property bequeathed to the devil, and it was there that the most splendid manifestations of his presence took place.

"At night a large fire could be seen with a great number of persons around it, the noise of chains, howlings, cries of rage and noisy laughter filled the air, and the belated traveller trembled in his shoes as he heard horrible blasphemy and insults hurled at him.

"In some instances the devil chose to appear less offensive and to take delight in amusing the peasants. One Sunday, on one of the coldest days of January, the people of the Forges returning from mass were astonished to perceive a man in his shirt-sleeves, bare-headed, quietly shaving himself in front of a little glass suspended from the bark of a tree. The scene was too funny for fear, but none of the good people doubted but that this was a frolic of their enemy.

"Nearly all those who passed along this road experienced some mishap. Generally, the horses would suddenly stop, and nothing would induce them to start. It was terrible to be thus caught right in the devil's own quarters. There was, however, one infallible means to make the horses start; the bridles were turned upside down and immediately the horses started at full gallop.

"You would laugh, said Père Louison, the narrator of these remarkable events, but the thing has been told to me hundreds of times. You see, said he, many strange things have happened upon this road."

"Les Forges de St-Maurice" carried on its operations under the management of changing ownerships, and produced iron, practically continuously, until as late as 1883, setting up a unique record in Canada. In that year, after some years of unprofitable operations, they were abandoned. Parts of the old ruins still stand to-day as an historic monument to the earliest period in the history of Canada's iron industry. Visitors may still see these picturesque remains. A pile of rocks indicate the "higher forge," where the ore was reduced to iron; a tall

chimney, site of the smith's forge; and a gable end of the manager's residence, framed with trees, where the French Intendent, and later the English Governors, were often received in state on visits to the largest industry of His Majesty in Canada.

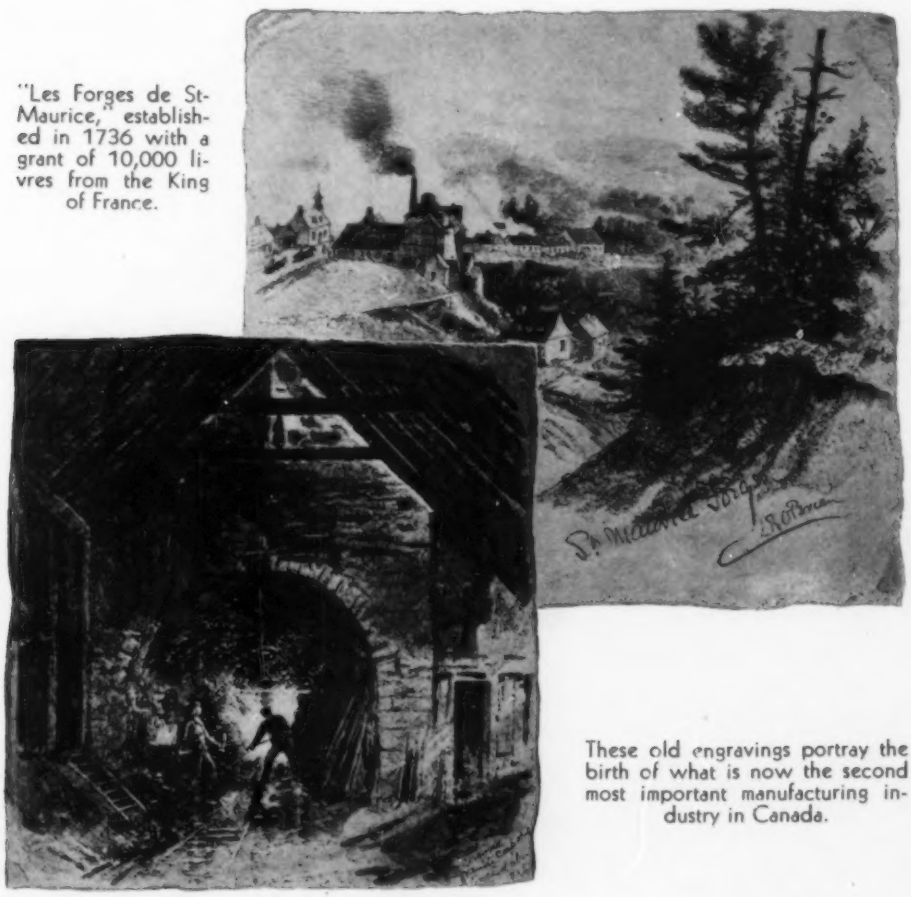
Gradual Development of Iron Industry

In 1787 steps were taken to develop the iron industry in Nova Scotia, and to this purpose the Nova Scotia Assembly appointed a committee to determine the advisability of a bounty system as a means of encouraging the establishment of an iron industry. This committee decided favorably and suggested a bounty of about forty pounds sterling for the construction of a smelting furnace, and a further bonus of eighty pounds sterling for the production of any quantity of iron produced from Nova Scotian ores. A plant established at Wilmot, Nova Scotia, was the result of this encouragement to the industry, and a specimen of the iron, thus produced, was presented to the Assembly in 1790.

An early attempt to manufacture iron articles was made in the year 1800 at Lyndhurst, Ontario, (then called Furnace Falls), on the Gananoque River. The iron produced was of poor quality, however, and after two years, during which a small quantity of cast iron pots and kettles was produced, the attempt failed.

Normandale, in Western Ontario, was the scene of the next iron furnace venture. In 1815, one John Mason built a furnace to smelt the bog ores in the district. This effort failed in a few years, owing to the inexperience of the operators in the smelting of this type of ore, but in 1821 a reorganization of the company was undertaken, and a new blast furnace was built. An excellent quality of iron was produced, and the furnace continued in operation until 1847, when, due to exhaustion of ores in the neighborhood, this plant was closed.

In 1829, a furnace was built at Stellarton, Nova Scotia, and skilled iron workers were



"Les Forges de St-Maurice," established in 1736 with a grant of 10,000 livres from the King of France.

These old engravings portray the birth of what is now the second most important manufacturing industry in Canada.

Open hearth floor in the Hamilton, Ontario, Works of the Steel Company of Canada, showing loaded charging cars and scrap. The eleven open hearth furnaces have a capacity of 700,000 tons of steel ingots per year.

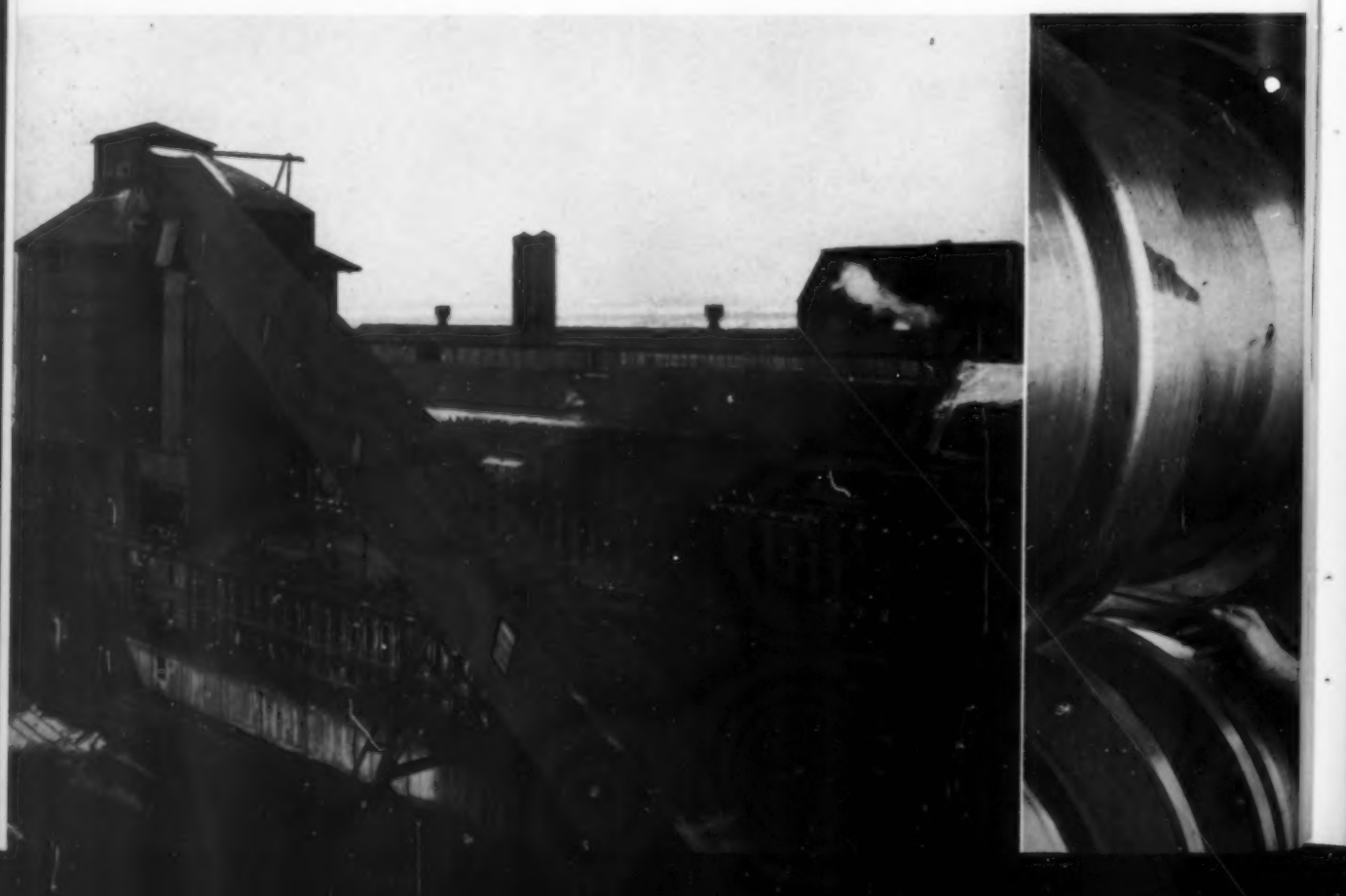
brought from England to direct operations, but the chemical composition of the product rendered it unsuitable for foundry purposes, and, after producing about 50 tons of iron, the project was abandoned.

The next venture was a company formed in 1825 by two Americans, and incorporated as the "Annapolis Mining Company," with its base of operations located near the mouth of the Moose River, Nova Scotia. After a few successful years in which cast iron hollow-ware and bar iron were produced, the works were closed in 1831, due to inability to compete profitably against imported English iron goods. A second attempt to operate this plant was made about 1857 or 1858, but it again proved unprofitable due to fluctuations in the price of gold.

In 1830 an iron works was started in the township of Marmora, in Hastings County, Ont., which had long been noted as the seat of a good grade of iron ore, but after operating for some years at considerable financial loss, the property was taken over by a group of Belleville industrialists who formed the "Marmora Foundry Company." A sum of $20,000 was spent on improvements and success seemed assured. The ore was rich and, from three tons of ore a ton of iron could be produced at a cost of less that $15.00 per ton. Evil days, however, befell the company, due to trouble with its stockholders, and in 1867 the properties were purchased by a group of financiers of Pittsburgh, Pennsylvania, to which the ore was shipped for some years.

In 1854 the Great Western Railway was under construction, and a company in Hamilton, Ontario, making railway accessories, offered $45 a ton for charcoal iron suitable for the manufacture of car wheels. A company was formed and a blast furnace built at Houghton, Norfolk County, Ontario, to meet this demand. Four hundred tons of iron were produced and shipped, but the entire quantity was rejected as the iron would not chill, and the works, costing $30,000, were abandoned. This was the last blast furnace to operate in Ontario until 1895.

Probably the most ambitious effort for the development of the iron industry in the early years was the establishment of the Acadia Mining Company, at Londonderry, N.S., a high quality of iron being produced from ore found in the Cobequid Hills. The original furnace installed at the inception of the plant (about 1850) continued "on blast" until 1874, and its total production is estimated at about 45,000 tons of pig iron. In 1873 the "Steel Company of Canada" (no connection with the present corporation bearing that title) was organ-



ized by a group of English financiers to take over the assets of the Acadia Mining Company.

The company was capitalized at $2,500,000, and what was then the most modern equipment for the production of steel was installed. One large blast furnace, designed for making pig iron with coke was built, and equipment installed for the production of steel by the newly invented "Siemens Open Hearth" process. The company was apparently originally organized with the main intention of installing a rail mill for the production of rails to be supplied to the Canadian Pacific Railway Company, which was then considering the construction of its lines into Nova Scotia. Being the only steel plant of any consequence, at the time, in Canada, the prospects for success of the venture seemed decidedly favorable. However, the postponement of the proposed construction by the C.P.R. had a serious effect on the fortunes of the steel plant, and in addition, the experiments made with the Siemens process did not succeed as expected. Sir William Siemens, the inventor, came out from England to investigate the difficulties, but his efforts met with no better success, and much valuable machinery was thus rendered useless.

Twelve puddling furnaces and a foundry were then built, and these, together with the blast furnace and an 18 inch and 9 inch bar mill, constituted the active equipment of the plant. In the next few years a small quantity of nail plate, car axles and wheels and pig iron, were produced. This output was very unprofitable, however, and in 1883 the company went into liquidation. Shortly afterwards the plant was purchased by English interest, and operated as the Londonderry Iron & Mining Company. A pipe foundry was installed in 1887 and operated until 1891. In 1895 operations were resumed with the blast furnace, rolling mills, and foundry, but after two years of activities this company shared the fate of its predecessor and went into liquidation. In 1898 Drummond McCall & Company, of Montreal, leased and operated the pipe foundry until 1902, when the plant was seriously damaged by fire. In 1903, the Drummond interests, a group of Canadian

Operations at the plant in Sault Ste. Marie, Ontario, of the Algoma Steel Corporation. (LEFT)—Coke plant, indicating a battery of 53 ovens recently installed. (CENTRE)—Checking the rotation of huge rolls for the 30-inch rail and structural mill. (RIGHT)—Thirty-inch rail and structural mill, whose capacity is 360,000 tons per annum.

industrialists, acquired the plant, rebuilt the blast furnace, and installed a steel foundry. Operations were of a more or less desultory character in the following years, and in 1913 the plant was finally abandoned, leaving the ruins as another monument to the faith and effort of Canadian enterprise in its struggle against adversity, for such monuments are often eloquent, though silent epitomes, of the courage and daring characteristic of nation builders.

Establishment of Rolling Mills

Co-incident with the growth of the primary production of iron, the establishment of rolling and finishing mills as secondary and separate branches of the industry began to develop, dependent almost entirely on imported billets to be rolled into usable commodities, chiefly bars for railway supplies, nails, bolts, and other types of fasteners. Like the earliest production of pig iron in Canada, these finishing mills seem to have been first established in the province of Quebec. As early as 1838, nail plate was being rolled in Montreal, and cut nails were being manufactured by Thomas Peck, later known as Peck, Benny & Co., and now the Peck Rolling Mills (a subsidiary of the Dominion Steel & Coal Corporation). In 1857 the Victoria Iron Works was established in Montreal, and by 1864 these plants were capable of supplying the province with its entire requirements of nails. The Maritime Provinces were also developing a finishing mill industry at about this period. In 1856 a plant was built at Saint John, New Brunswick, by the Portland Rolling Mills Company, for the manufacture of bar iron, nails and spikes and in 1873 the Coldbrook Rolling Mills Company, was formed and was equipped to manufacture a large range of products. The Toronto Wire and Iron Works was formed in 1854, and the present B. Greening Wire plant was established in 1859. In 1860, Gzowski & MacPherson established a rolling mill in Toronto to re-roll rails, and to make bar iron from scrap.

Other mills which followed with the growth of the industry were the Pillow

Scenes at Sault Ste. Marie, Ontario, in the Algoma Steel Corporation's plant. (LEFT)—Dock at which coal from mines in West Virginia is discharged. Charging molten pig iron to an open hearth furnace. (RIGHT)—Pouring molten steel from the open hearth furnace into the ingot moulds. Alloy steel streaming from the open hearth into the ladle, slag running over the sides.

Hersey Company, the Montreal Rolling Mills Company (now a unit of the Steel Company of Canada Limited), and the Abbott & Hodgson Company, (Metropolitan Rolling Mills) in Montreal, and numerous others scattered through the Eastern and Maritime Provinces.

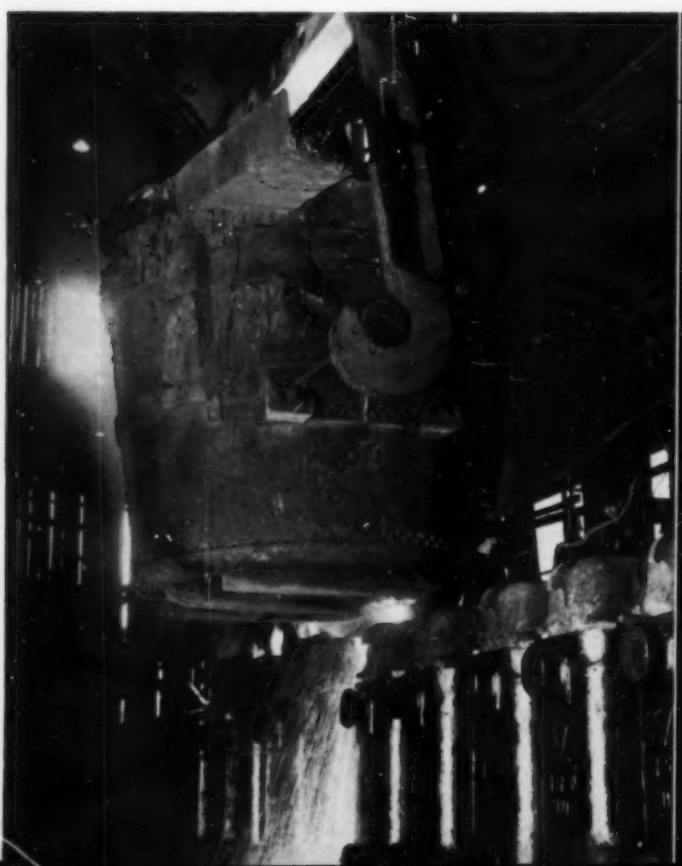
Development of Steel Manufacturing

After the middle of the nineteenth century, two vitally important inventions revolutionized the steel industry. One was the invention in 1856 of the "Bessemer" process by Henry Bessemer of England, and the other the "Open Hearth" process invented by the Martin brothers of France in 1864. These inventions marked the closing of what might be called the Iron Era, and the birth of an era in which the production and consumption of steel was to reach gigantic proportions.

It will be seen that the effort to establish an iron industry in Canada was slow in progress, but persistent and courageous, despite many failures, and the expenditure of much money with varying degrees of success. There was some definite advance in the industry in the early years following the introduction of the "National Policy" of 1879, and the granting, in 1883, by the government of the day, of a bounty to assist the production of pig iron. In 1889 the "Nova Scotia Steel and Forge Company" was incorporated with a capital of $1,000,000. A blast furnace and a battery of coke ovens were built and came into operation in 1892. This may be fairly said to have marked the production of pig iron in Canada as a national industry. Some years later, due to a diminishing supply of local iron ore, the Wabana deposits in Newfoundland were purchased for $120,000.

Meanwhile several developments were taking place in the Ontario iron industry, the most successful of which was the establishment in 1895 of the Hamilton Blast Furnace Company, at Hamilton. A blast furnace of modern type was "blown in," and this furnace, started in 1895, is the oldest in Canada still active. The company produced pig iron for foundry use, and after a number of years of successful operation combined with the Ontario Rolling Mills under the title of the Hamilton Steel & Iron Company, (now the main unit of The Steel Company of Canada, Limited). The bounties on the production of pig iron were continued by succeeding governments until 1911, covering a period of 28 years, and proved to be a needed stimulant for the successful promotion of the industry in Canada.

The primary operation in the manufacture of steel is the smelting of iron ores in a blast furnace for the production of pig iron, and to this end, coke, which is



converted from bituminous coal, is a necessary element. (It takes one and a half tons of coal to produce one ton of coke, and, roughly two tons of ore, one ton of coke, and half a ton of limestone to produce one ton of pig iron.) In the early days of production of iron in Canada, the form of carbon used for the reduction of iron oxide to metallic iron was charcoal, obtained by the carbonization of wood. As the scope of operations increased, however, this was found too expensive and impractical, as blast furnaces were being built in increasing size and capacity, and it had been discovered that coal could be converted into an excellent reducing medium by treating it in the same manner as wood had been treated for conversion into charcoal.

This product of the baking of coal was called "coke." It is a much purer form of carbon than the source from which it is made, and has the advantage over charcoal of a much greater mechanical strength, and is thus better able to carry the weight of the charges, especially in blast furnaces of the sizes that are built to-day.

When the manufacture of pig iron commenced in Canada as an established industry, no coke was made in Canada, and in fact, very little was made anywhere in North America, except at the coal mines, and the government rendered further assistance to the industry by the admission of coke, duty free, into Canada, for the production of pig iron. As coal, in the process of carbonization, loses weight, it became the practice to build the ovens near the mines, and ship the coke to the furnaces at a saving in the cost of freight. This coke was produced in the simple but unscientific bee-hive oven, which allows the volatile elements in the coal to escape, and no by-products were recovered. The introduction, however, of the modern by-products recovery coke oven brought about a complete change, and now involves an intergrated plant with units for the production of coke, pig iron and steel, and the recovery of those valuable by-products of coal which form one of the major economies in the modern practice of iron and steel manufacture. The principal by-product, coke-oven gas, finds its use, as a fuel, in the steel works, at the open hearth furnaces and elsewhere, while the other by-products, such as tar, sulphate of ammonia and the light oils, create a more accessible market when thus produced than would be the case at such centres as the coal mines.

After the turn of the century, the production of metallurgical coke in Canada became essential, and free bituminous coal for conversion into metallurgical coke then became necessary to offset the existing condition which permitted the importation of coke, duty free, and to enable the Canadian steel manufacturers to bring their coke and blast furnace operations into line with the latest and more economic practices.

In 1906 the government established a customs tariff drawback on imported bituminous coal when such coal was converted into metallurgical coke to be used only in the smelting of ores in blast furnaces.

At this period, and during the succeeding years, the steel industry in Canada made tremendous strides in productivity and growth. In 1896 only six furnaces were producing pig iron in Canada with a total daily capacity of under 500 tons. In 1911 the capacity of the Canadian furnaces had increased to over 3,000 tons daily, while to-day the industry produces as much pig iron in one month as was produced in a whole year in the 'nineties. It is also worthy of note that despite the growth of pig iron production, the conversion into steel and the manufacture of rolled steel bars, it was not until 1908 that the Canadian demand for the steel products manufactured warranted the expense necessary for equipment such as used in American practice.

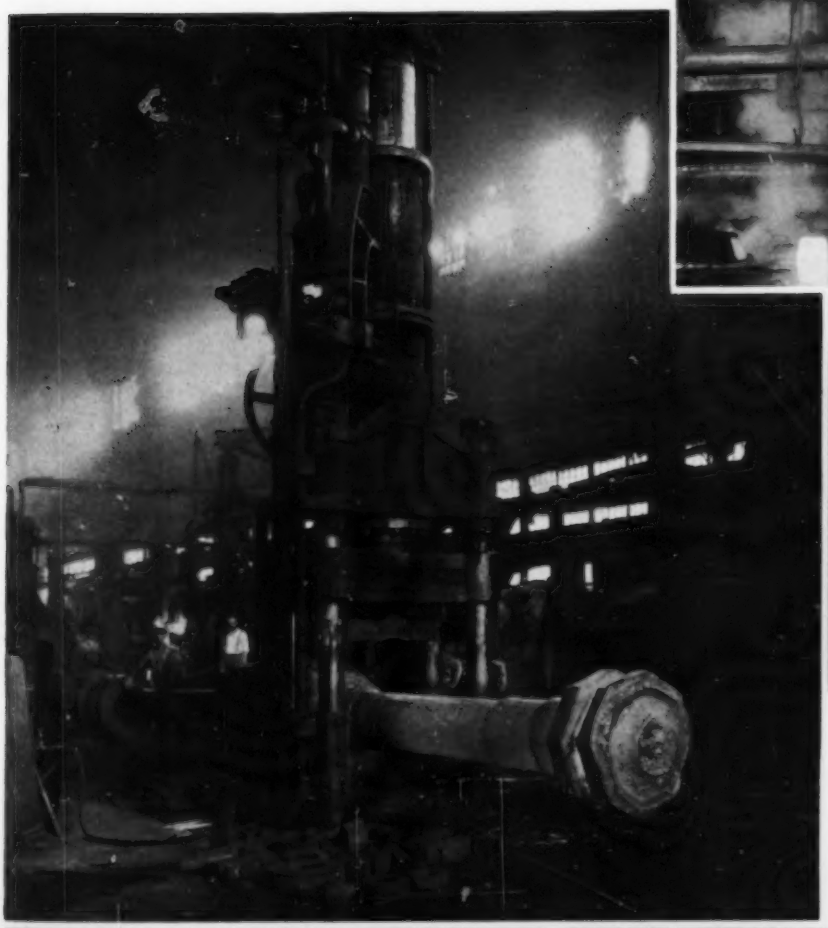
About 1898 the steel industry was established at Sault Ste Marie, Ontario, by the formation of the Consolidated Lake Superior Company with a capitalization of $20,000,000. Some years later a reorganization of the company was undertaken with the acquisition of additional subsidiaries, and formed the Lake Superior Corporation. In 1912 a further reorganization took place when the Algoma Steel Corporation, formerly the Lake Superior Iron & Steel Company, took over the plant, properties and business of the Algoma Steel Company, the Lake Superior Power Company, and other subsidiaries of the Lake Superior Corporation. The original plant of the Algoma Steel Company consisted of two small blast furnaces (one of which was intended for a charcoal iron furnace, a Bessemer plant of two 5-ton converters, having a combined capacity of 600 tons of steel

TOP: —Smooth forgings ready for the lathe.

CENTRE: —Mine hoist drum shaft forging under 600-ton hydraulic press.

BOTTOM:—Eight throw Diesel engine crankshafts.

Photos by Canada Foundries & Forgings, Ltd.

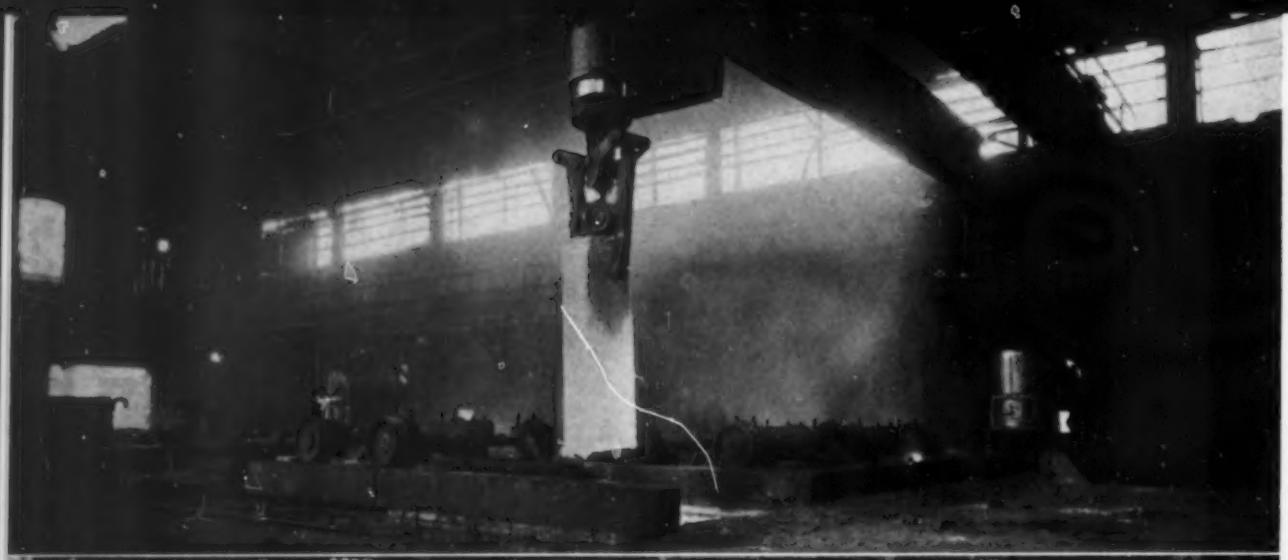


TOP: —Rolling nickel steel rods for fabrication of rivets.

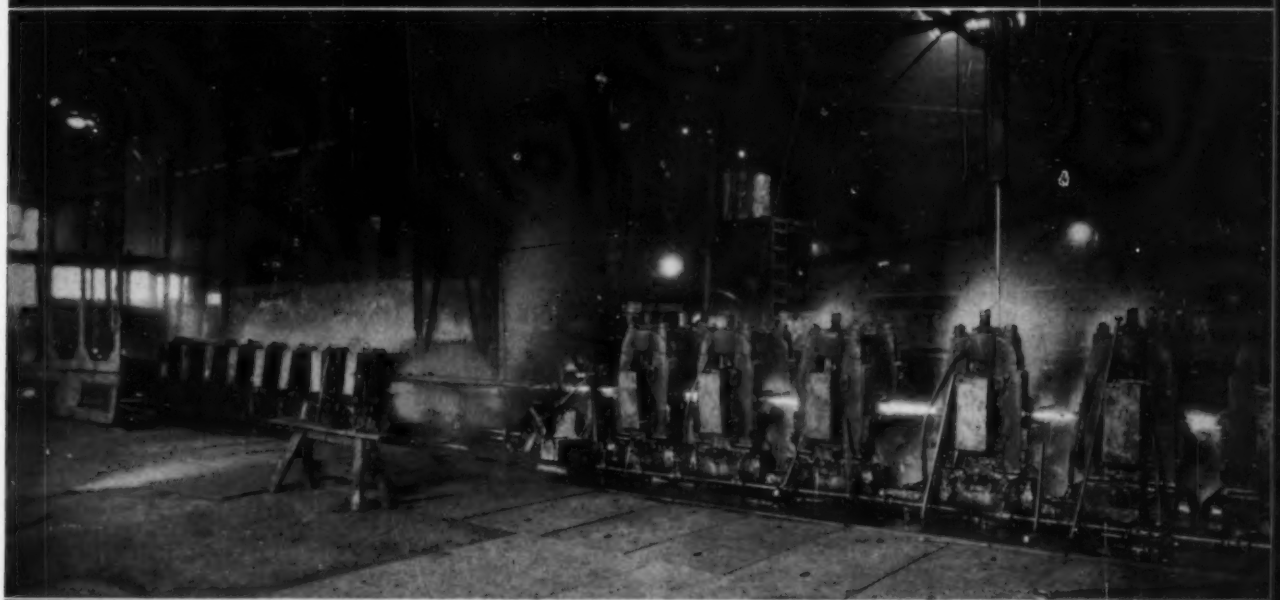
CENTRE: —Closer view of above scene.

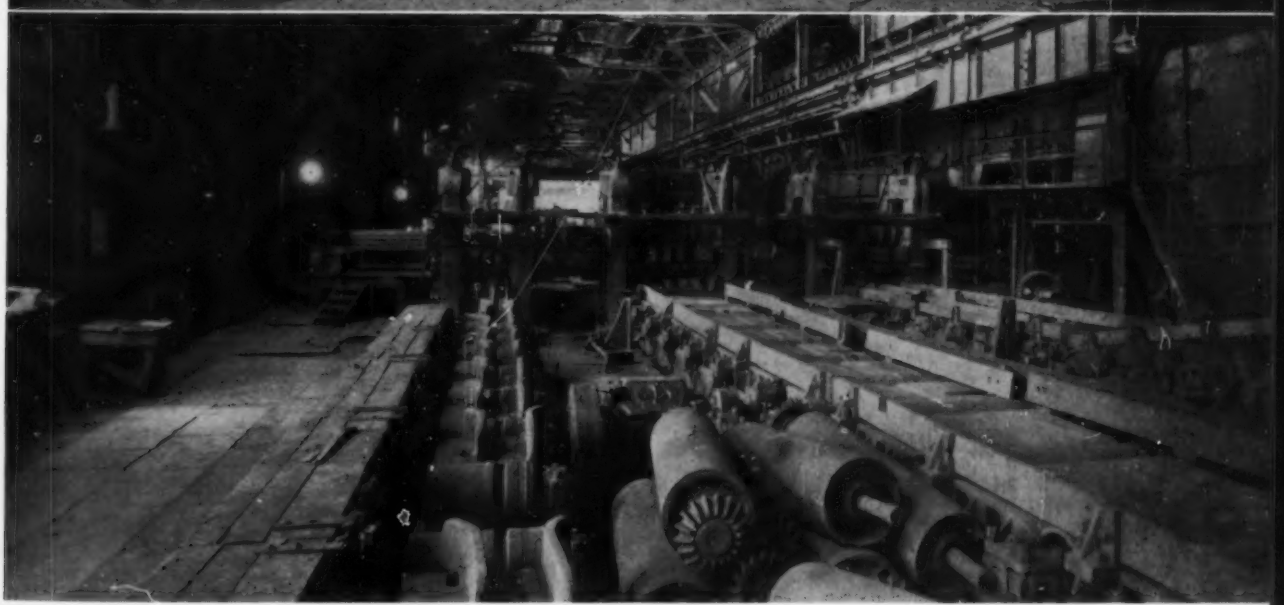
BOTTOM:—"Tapping" or threading nuts.

Photos by Canadian Tube & Steel Products, Ltd.



TOP:—Seven-ton ingot being extracted from pit furnace for rolling in the blooming mill.
CENTRE:—Barb wire department of wire and nail mill, whose annual capacity is some 60,000 tons of assorted wire and nail products.
BOTTOM:—Colliery at Glace Bay, Nova Scotia, from which the main plant of the Dominion Steel and Coal Corporation at Sydney, N.S., secures the bulk of its fuel requirements.





TOP:—Continuous billet mill, the annual capacity of which is 150,000 tons of steel billets.

CENTRE:—Continuous rod mill, capable of producing 95,000 tons of rods yearly. Square billets from the furnace are rolled into rods and pass to the cooler without a halt.

BOTTOM:—Rail mill in which it is possible to roll 250,000 tons of steel rails per annum, and designed for the fabrication of certain other sections.

Photos by Dominion Steel & Coal Corporation.

per day, a 32-inch blooming mill, and a 23-inch rail mill. The first rails were turned out on May 5, 1902, being the first standard rails to be made in Canada. In 1907, the open hearth process of steel making was introduced with the formation of the Lake Superior Iron & Steel Company, Limited, and the installation of two open hearth furnaces. From 1909 to 1912 considerable additions were made to the plant, consisting of two batteries of coke ovens, a by-product recovery plant, a third blast furnace, additional open hearth furnaces, a new 35-inch blooming mill, an 18-inch and a 12-inch merchant mill, and increased capacity of the rail mill. The development of this period included the opening of the Magpie mine in the Michipicoten district and the acquisition of limestone lands in the state of Michigan, coal mines in West Virginia, and iron ore from the Lake Superior district in the United States. Further additions to plant, and improvement of producing facilities, followed with the march of time.

At the present time the plant in operation at Sault Ste. Marie comprises four blast furnaces, having a capacity of 675,000 tons of pig iron per annum, twelve open hearth furnaces, having a capacity of 540,000 tons of steel ingots per annum, 158 by-products recovery coke ovens, which have a capacity of 720,000 tons of furnace, foundry and domestic coke per year, in addition to the by-products of tar, sulphate of ammonia and the light oils. Some 2,400,000 gallons of light oil and 1,920,000 gallons of benzol can be produced per annum. There are also a 35-inch blooming mill, whose capacity is 600,000 blooms a year, a 32-inch billet mill, whose capacity is 72,000 tons of billets per annum, a 30-inch rail and structural mill, whose capacity is 360,000 tons per annum, and eighteen-inch and twelve-inch merchant mills, having a combined capacity of 144,000 tons per annum.

The main plant occupies an area of 185 acres, and is served by 40 miles of owned railway lines. Being located at the junction of Lakes Superior and Huron, it is well situated for the assembly of raw materials, and the shipment of finished products by water. The products of the company cover a wide range of carbon and alloy steels in finished and semi-finished forms, together with pig iron, coke and its by-products.

In 1900 the Nova Scotia Steel and Coal Company was formed, with a capitalization of $7,000,000, to take over the properties and interests of most of the interdependent industries; steel making, coal mining and railroading in Nova Scotia.

During the previous year, the Dominion Iron and Steel Company had been formed by interests allied with the Dominion Coal Company, as a regular purchaser of the coal, and in 1909 the two companies were merged to form what was then the largest industrial amalgamation in Canada, the Dominion Iron and Steel Corporation. In 1921, amalgamation was effected with the Nova Scotia Steel and Coal Company, forming the British Empire Steel Corporation. Further reorganization and amalgamations were brought about in 1918, and the steel, coal, and related industries in the Maritime Provinces are now administered by the Dominion Steel & Coal Corporation. The supply of iron ore and limestone is obtained from Newfoundland, while the coal is mined in Cape Breton, Nova Scotia, where the main plant of this corporation is situated. This plant covers an area of 460 acres, with a railway track mileage of 50 miles.

The main plant of this corporation is situated at Sydney, Cape Breton, which is the eastern terminus of the Canadian National Railways system, and also offers excellent facilities for water transportation. Piers, where limestone and ore from Newfoundland are discharged, and where, also, the various steel products of the plant are loaded for water shipment, add to the impressive sight formed by the general immensity of the steel works.

The principal units of the plant at Sydney comprise three blast furnaces, having a capacity of 400,000 tons of pig iron per annum, twelve tilting open hearth furnaces (two of 100 tons and ten of 50 tons capacity each), and one 20-ton electric furnace, having a combined capacity of 425,000 tons of steel ingots a year. There are 180 "Koppers" by-product coke ovens in three batteries of sixty ovens, a by-product recovery plant and a "Koppers" benzol plant, which have a capacity of 400,000 tons of coke and 2,000,000 gallons of light oil per annum. In addition, there are a 40-inch blooming mill, whose capacity is 375,000 tons of steel blooms per year; a 16-inch (continuous) billet mill, having an annual capacity of 150,000 tons of steel billets and driven by the

largest electric motor of its kind in Canada, developing 10,000 horse-power; a 28-inch rail mill, having a capacity of 250,000 tons of rails per year, and designed to roll certain other sections, such as tie plates and mine arch beams; a 12-inch bar mill, of semi-continuous type, whose capacity is 50,000 tons per annum; a 10-inch (continuous) rod mill, with an annual capacity of 95,000 tons; and a wire and nail mill, capable of producing between 55,000 and 60,000 tons of assorted wire and nail products per year. The galvanizing and patenting department is capable of handling 60 tons per day.

The company also maintains a complete system of shops at the Sydney plant for repair and replacement work, including a large foundry having a capacity of 7,500 tons of iron castings per year. In addition to the plant at Sydney, Nova Scotia, the company operates merchant bar mills and a plate (jobbing) mill at Trenton, Nova Scotia, units of the Nova Scotia Steel & Coal Company, Limited, which was taken over in the original amalgamation, these mills having a combined annual rolling capacity of 114,000 tons; also one 14-inch and one 9-inch bar mill at Montreal (Peck Rolling Mills, Limited,) with a combined annual rolling capacity of 26,900 tons; and twelve cut nail machines with a total annual capacity of 400 tons. The company also operates James Pender & Company, Limited, of Saint John, New Brunswick, for the manufacture of wire and wire nails.

The blast furnaces and steel works of the Nova Scotia Steel & Coal Company, at Sydney Mines, Nova Scotia, and the open hearth furnaces at Trenton have been dismantled.

The products of the company cover a wide range of carbon and alloy steels in finished and semi-finished form as indicated by the description given of the various mills, in addition to pig iron, coke and the by-products recovered.

On June 9th of the same year (1910) which saw the formation of the Dominion Iron & Steel Corporation there came into existence another amalgamation of steel interests with a capitalization of $28,000,000. The company was formed to amalgamate the Hamilton Iron & Steel Company, (itself an amalgamation of the Hamilton Blast Furnace Company, and the Ontario Rolling Mills Company), with the Montreal Rolling Mills Company, the Canada Screw Company, the Dominion Wire Manufacturing Company, and the Canada Bolt & Nut Company. The charter of incorporation gave the name as "Canadian Steel Corporation Limited," but it subsequently became known that this title had been previously adopted by another company, and at a meeting held on June 17, 1910, a resolution was passed which resulted in a change of title to the Steel Company of Canada, Limited, duly promulgated on June 22, 1910, by Hon. Charles Murphy, then Secretary of State for Canada.

The manufacturing activities of the Steel Company of Canada cover a range which comprises all the important steel products, in common use, in a wide diversity of articles. They have the distinction of being manufacturers of a greater diversity of products than any other steel company on this continent, and probably in the world. By reason of circumstances coincident with the amalgamations which took place in the formation of the company, it is unique to find such unrelated articles as putty, white lead, and lead shot listed among its products. For the manufacture of the latter, the company possesses the only operating drop shot tower in Canada.

The company's main plant is situated at Hamilton, Ontario, covering approximately 319 acres, and the present railway trackage is in excess of 28 miles, while their various other plants are located at different points in the provinces of Ontario and Quebec.

The principal units of the company, and their respective capacities are as follows: Brantford Works, where bolts and nuts are manufactured, the capacity being 1,800 tons per annum; Canada Works, at Hamilton, Ontario, where are operated wire and wire nail machines, the annual capacities of these being 40,000 tons of plain wire, 10,000 tons of wire nails, 2,000 tons of barbed wire, 2,000 tons of wire fencing, and 10,000 tons of galvanized wire. The wire-drawing capacity has recently been augmented, and machinery installed for the manufacture of steel hoops, together with a wire patenting furnace.

At the Dominion Works, at Lachine, Quebec, is a wire mill and machines for the production of wood screws, the annual capacities being 30,000 tons of plain wire, 3,000 tons of barbed wire, 16,000 tons of

galvanized wire, 9,600 tons of wire fencing, and 250 tons of wood screws. Equipment for galvanizing wire by a new process has recently been installed at these works. At the Upper Gananoque Works, in Gananoque, Ontario, there are eleven forging hammers for the manufacture of automotive, commercial, railway and agricultural forgings, the annual capacity being 1,200 tons. Here are also manufactured "Phoenix" drop forge horseshoes, drive and screw calks.

The Hamilton Works, at Hamilton, have two blast furnaces, with a capacity of 340,000 tons of pig iron per annum, eighty "Wilputts" by-product ovens, a by-product recovery plant and a "Wilputts" benzol plant, the annual capacity of these being 397,300 tons of coke and 2,605,000 gallons of light oil. There are also eleven stationary open hearth furnaces (four of 50 tons, four of 100 tons and three of 175 tons), whose capacity is 700,000 tons of steel ingots per year. Here are operated, in addition, a 34-inch blooming mill, with a capacity of 425,000 tons of blooms a year, one 18-inch billet and sheet bar (continuous) mill, whose annual capacity is 375,000 tons, one combined 12-inch—10-inch merchant bar mill, with a yearly capacity of 80,000 tons, one 10-inch merchant bar mill, whose capacity is 40,000 tons per annum, and a 44-inch blooming mill recently installed. The sheet mills, including one jobbing mill, have an annual capacity of 120,000 tons of sheets, other equipment being heating, box annealing, blue annealing and normalizing furnaces, "Cook" pickling machines and galvanizing pots. There is a 12-inch roughing and 10-inch finishing rod mill, whose annual capacity is 550,000 tons.

In the Notre Dame Works, at Montreal, are a wire mill, with a capacity of 30,000 tons of plain wire, 1,300 tons of galvanized and tinned wire, wire nail machines, whose capacity is 13,000 tons per annum, cut nail and tack machines, whose capacity is 1,100 tons per year, horseshoe machines, which can produce 5,000 tons a year, horseshoe nail machines having a yearly capacity of 560 tons, and toe calk machines, which can produce 450 tons per annum. Here also is equipment for the manufacture of bolts, nuts, rivets, etc., with a capacity of 8,000 tons per year. The rolling mills are at present undergoing extensive alterations for the installation of a continuous furnace and modern 18-inch mill, besides combination 18-inch—12-inch—9-inch merchant bar mills.

At the Ontario Works, in Hamilton, is a 20-inch bar mill producing splice bars, tie plates, merchant bars, and rolled blooms and billets for forging, the annual capacity of which is 54,000 tons. In the St. Henri Works, Montreal, is a pipe mill, manufacturing butt-weld pipe from ¼-inch to 4 inches, the annual capacity being 22,000 tons of butt-weld pipe, and the galvanizing capacity 13,000 tons.

At "Swansea Works", Swansea, Ontario, bolts, nuts and rivets are manufactured from equipment with annual capacity of 5,000 tons of track-bolts and nuts, and 17,500 tons of bolts and nuts, (other than track) and steel rivets of various types and sizes.

At "Western Wire & Nail Works", London, Ontario, the company operates nail machines with annual capacity of 1,800 tons of wire nails.

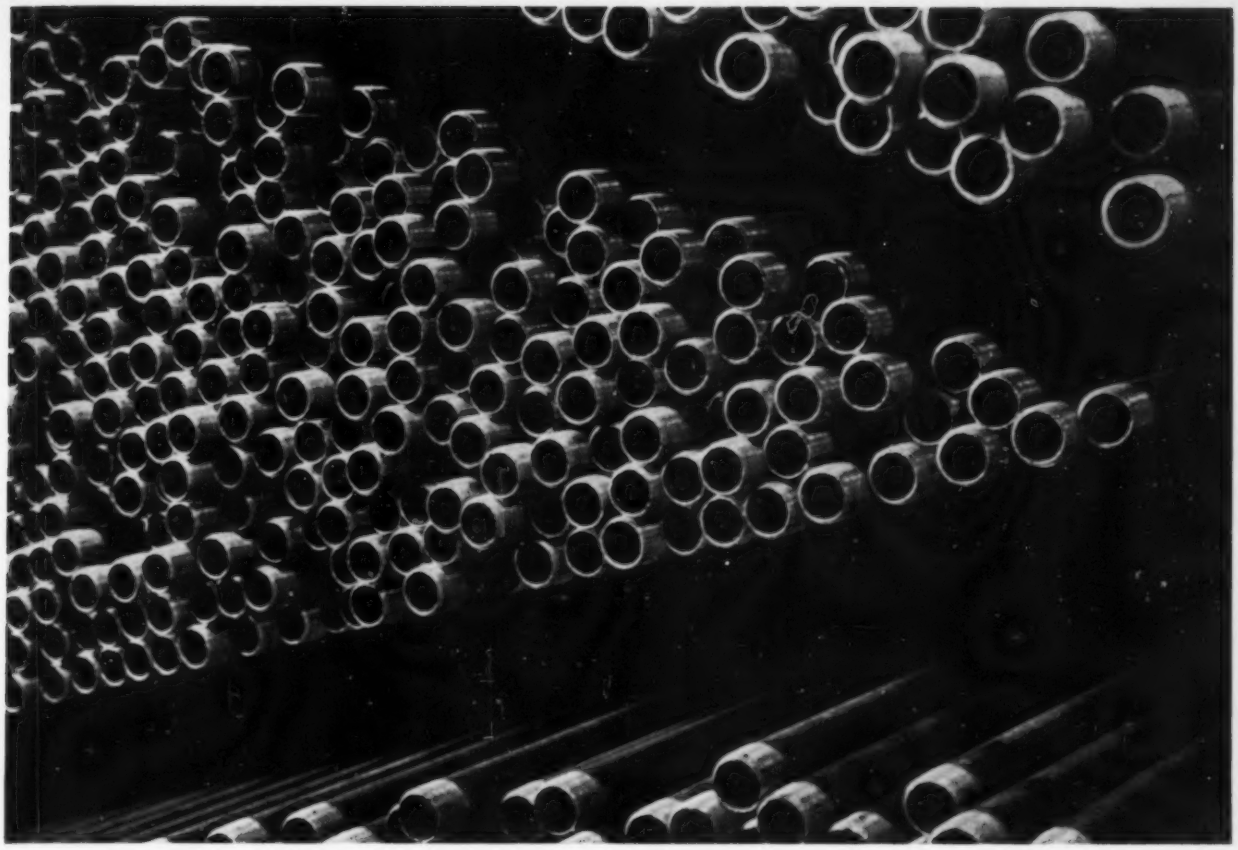
Steel Industry in Canadian Economy

The increase in steel production in Canada during the two years of 1927 and 1928 was much more rapid than in the United States, due to larger construction programmes. The rate of increase in construction was actually five times as rapid in Canada as in the United States, during the two years mentioned.

The plants in the iron and steel industry in Canada are classified in 13 industrial groups according to the principal products made, and 12 of them showed higher output values in 1928 than in previous years. Ontario, with 693 plants, accounted for a production valued at $428,863,000, and Quebec's 226 plants totalled $11,376,964. Manitoba, Nova Scotia, British Columbia, New Brunswick, Alberta and Prince Edward Island followed in the order named.

The increase in value of steel production in the one year 1927 to 1928 was approximately $84,000,000, with a total value of $610,000,000.

The leaner years which have followed, as a result of the world-wide depression in trade, do not lessen the value of the industry's capabilities, as demonstrated, and in these days of heavy demands on the steel industries of Europe for the production of war material, Canada's steel industry, thanks to the happier and more peaceful atmosphere of its geographical position, is available for the



Pile of butt-weld pipe (above), showing the threaded ends. (Below)—Threading pipe, one of the many operations undertaken by firms engaged in the secondary steel industry of Canada.

production of a fair share of the world's needs in consumable steel goods for peaceful uses.

The following statistics provide an indication of the situation prevailing in the steel industry of Canada in recent years:

Year	Plants	Capital	Materials Purchased	No. of Employees	Salaries & Wages	Value of Products
1927	1,148	$638,914,893	$261,102,679	106,293	$143,351,174	$525,921,839
1928	1,159	702,931,186	309,618,574	119,199	168,320,038	609,632,999
1930	1,196	757,797,256	281,713,862	119,987	165,429,608	569,745,973
1935	1,249	555,144,467	203,981,458	95,426	110,402,366	390,228,929

PERCENTAGE OF TOTAL MANUFACTURING IN CANADA

	1927	1928	1930	1935
Vegetable Products	21.00	20.25	19.60	18.16
Iron and Its Products	*15.49*	*16.31*	*16.62*	*13.90*
Animal Products	13.48	12.98	12.18	12.52
Textile and Textile Products	11.25	11.11	10.55	12.72
Wood and Paper Products	18.55	18.26	18.57	15.72
Non-ferrous Metal Products	5.90	6.37	7.30	10.28
Non-metallic Mineral Products	5.18	5.51	6.32	6.28
Chemicals and Chemical Products	3.76	3.93	3.50	4.22
Miscellaneous Industries	2.33	2.28	1.69	1.32

The three corporations specifically mentioned above, the Algoma Steel Corporation, Limited, Dominion Steel & Coal Corporation, Limited, and The Steel Company of Canada, Limited, are the only producers, in Canada, of iron and its products, from the ore to semi-finished and finished articles. (The only other company smelting iron ore in Canada at the present time is the Canadian Furnace Company, Limited, of Port Colborne, Ontario, operating one blast furnace with an annual capacity of 100,000 tons of foundry and malleable pig iron, and 30,000 tons of spiegeleisen, without further manufacture). As primary producers the mentioned corporations constitute the core of the Canadian steel industry. Taking their raw materials from the earth, assembling them at the mills, and, after several major metallurgical and mechanical operations, shipping the resulting products to their customers, these operations require a tremendous investment in mines, land, buildings and equipment.

In the wake of the primary producers follow the large number of secondary steel industries, scattered through the Dominion, which occupy, in their varied branches, a most important position in the life and progress of the steel industry. There are those which purchase their raw materials in a semi-finished state and convert them into finished products of multifarious forms for diverse uses. But, with the vastly increased development of Canada's water powers in the generation of electric energy, some of these secondary industries are producing steel for their own manufacturing purposes, converted from iron and steel scrap by the electric furnace process, thus rendering themselves, to some extent, independant of imported or domestic purchases of billets or other forms of semi-finished material, required for further manufacture.

In the manufacture of steel pipe there are, at present three producers in Canada, The Steel Company of Canada, Limited, The Canadian Tube & Steel Products, Limited, located in Montreal, and the Page Hersey Tubes, Limited, located at Welland, Ontario. The two former are manufacturers of butt-weld steel pipe as one of their many and varied steel products, while the latter confine their activities solely to the manufacture of steel pipe, and produce butt-weld, lap-weld and seamless tubes.

Secondary producers in the steel industry of Canada are legion in their variety of productive enterprises. Foundries, finishing mills, bridge and other structural assembling plants, automobile and aeroplane factories, shops for the construction of railway rolling stock, machinery, boilers, Diesel engines and a multitude of others requiring steel in some form as their raw material, add greatness to Canada's industry and progress. The average percentage of secondary steel production to primary steel production for the years 1927 to 1935 inclusive was 33.3 per cent.

Of the many industrial towns and cities throughout the Dominion, the city of Hamilton, Ontario (sometimes called "the Pittsburgh of Canada"), is particularly

outstanding, in industrial importance, as the home of a very large number of secondary steel industries. Prominent among them may be mentioned The Dominion Foundries & Steel, Limited, organized in 1912 as a steel foundry and operated as such until 1915, when it engaged in the manufacture of steel for war munitions. Following the close of the war a Universal plate mill was installed, and some years later additions were made for the manufacture of tin plate. The company's products are steel castings of all kinds up to 100,000 pounds each, forged steel car axles, universal plates up to 42 inches wide, sheared plate up to 78 inches wide, checker plate, tin mill black sheets and cold reduced tin plate; the plant having a capacity of approximately 150,000 tons annually of finished material. The Burlington Steel Company, Limited, also situated in this busy hive of industry, manufactures merchant and concrete reinforcing steel bars, angles, channels and special shapes, fence, posts, forged grinding balls and structural grade tubing. Their main manufacturing equipment consists of one 3-ton Lectromelt electric furnace; one continuous coal-fired heating furnace (non-regen); a 16-inch and 12-inch finishing bar mill, with an annual capacity of 18,000 tons of electric steel ingots, and 70,000 tons of bars. At literally every turn, in the city of Hamilton, one faces the enterprising efforts of secondary steel production in one form and another.

With new processes being constantly studied, and resulting in further development and modernization of plants, obsolescence is a vital factor in the life and progress of the industry, so that the fostering of such a vast and important industry to secure fair prices, from which profits are earned and wages paid, may well be regarded as a national necessity.

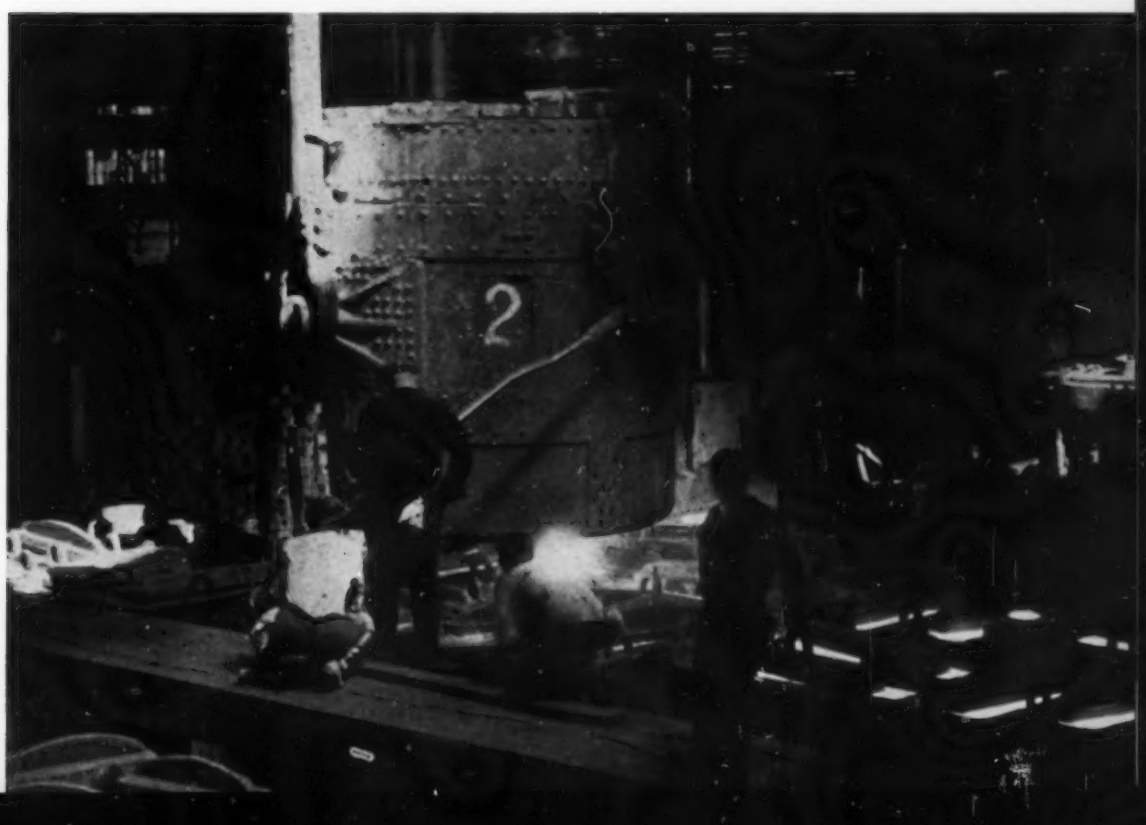
The value of the steel industry is well epitomized in the words of Mr. Walter S. Tower, Executive Secretary of the American Iron & Steel Institute:—

> "The steel industry may better be characterized as a servant of mankind whose fortunes may ebb and flow, but which works unceasingly to aid in advancing the economic liberty and prosperity of all classes of people. It is a servant which puts into the hands of man the most useful material now known."

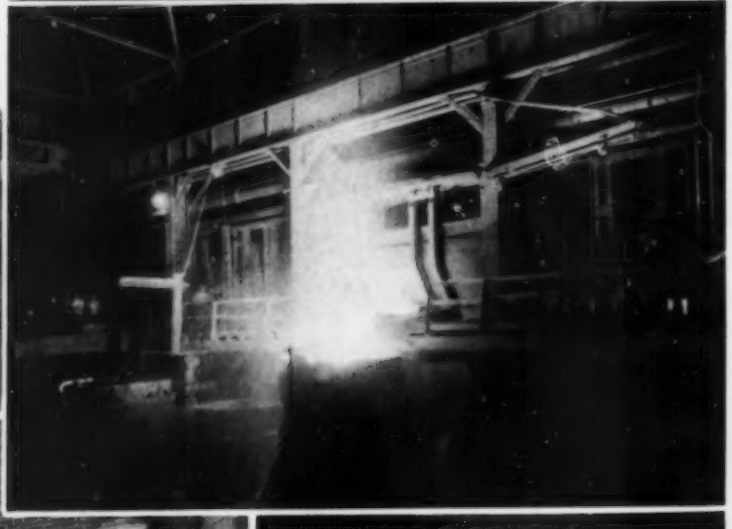
BIBLIOGRAPHY

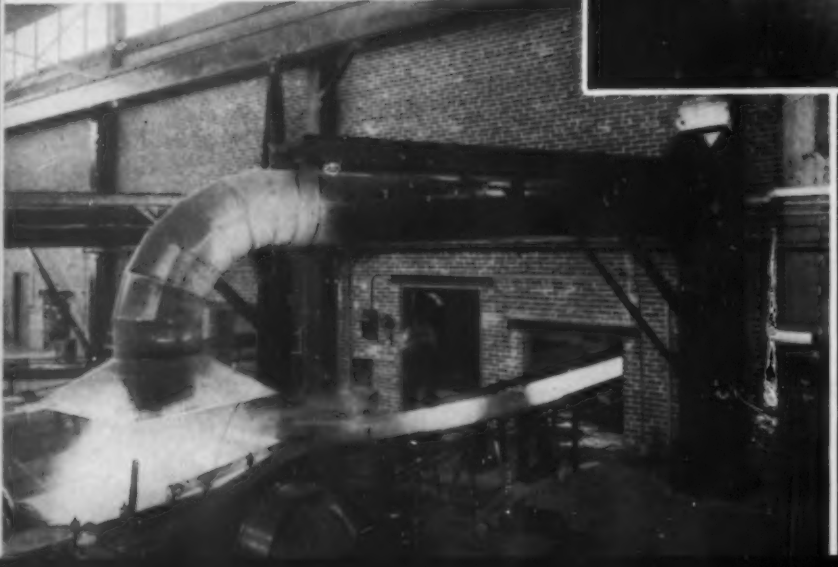
Committee on "The Canadian Iron and Steel Industry" of the Montreal Junior Board of Trade.—Mr. Thos. Hutchison of Drummond McGall & Co. Limited.—Mr. C. L. Jobb of Canada Iron Foundries Limited.—The Algoma Steel Corporation, Limited.—Dominion Steel & Coal Corporation, Limited.—The Steel Company of Canada, Limited.—Report on the Utilization of the Low Grade Iron ores of Canada—published by the Honorary Advisory Council for Scientific and Industrial Research, Report No. 14, 1924, Ottawa.—"A decade of Iron and Steel In Canada" and "Scrap Iron and Scrap Steel in Canada," published in 1938 by The Canadian Institute of Mining and Metallurgy.

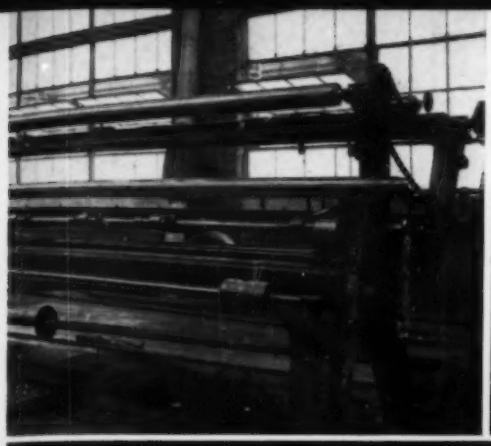
The Ingot Maker. Bottom pouring open hearth ingots at Dominion Foundries & Steel, Limited, Hamilton, Ont.



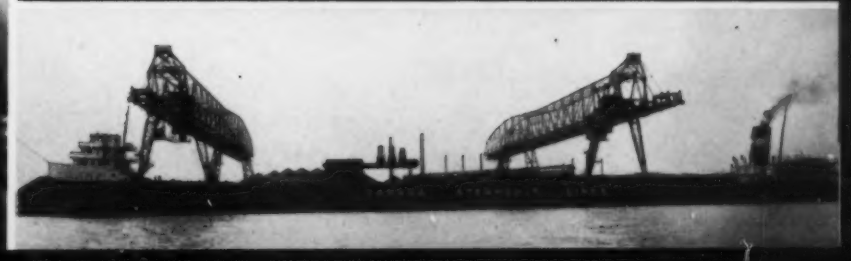
Small selection of operations in the Hamilton Works of The Steel Company of Canada. (Left to right on perimeter)—Skip hoist of blast furnace. Chain link fence machine. Barge shipment of steel. Sheet mill warehouse. Blast furnaces, trestles and ore piles. S.S. Lemoyne, longest freighter on Great Lakes, unloading ore. Open hearth mould



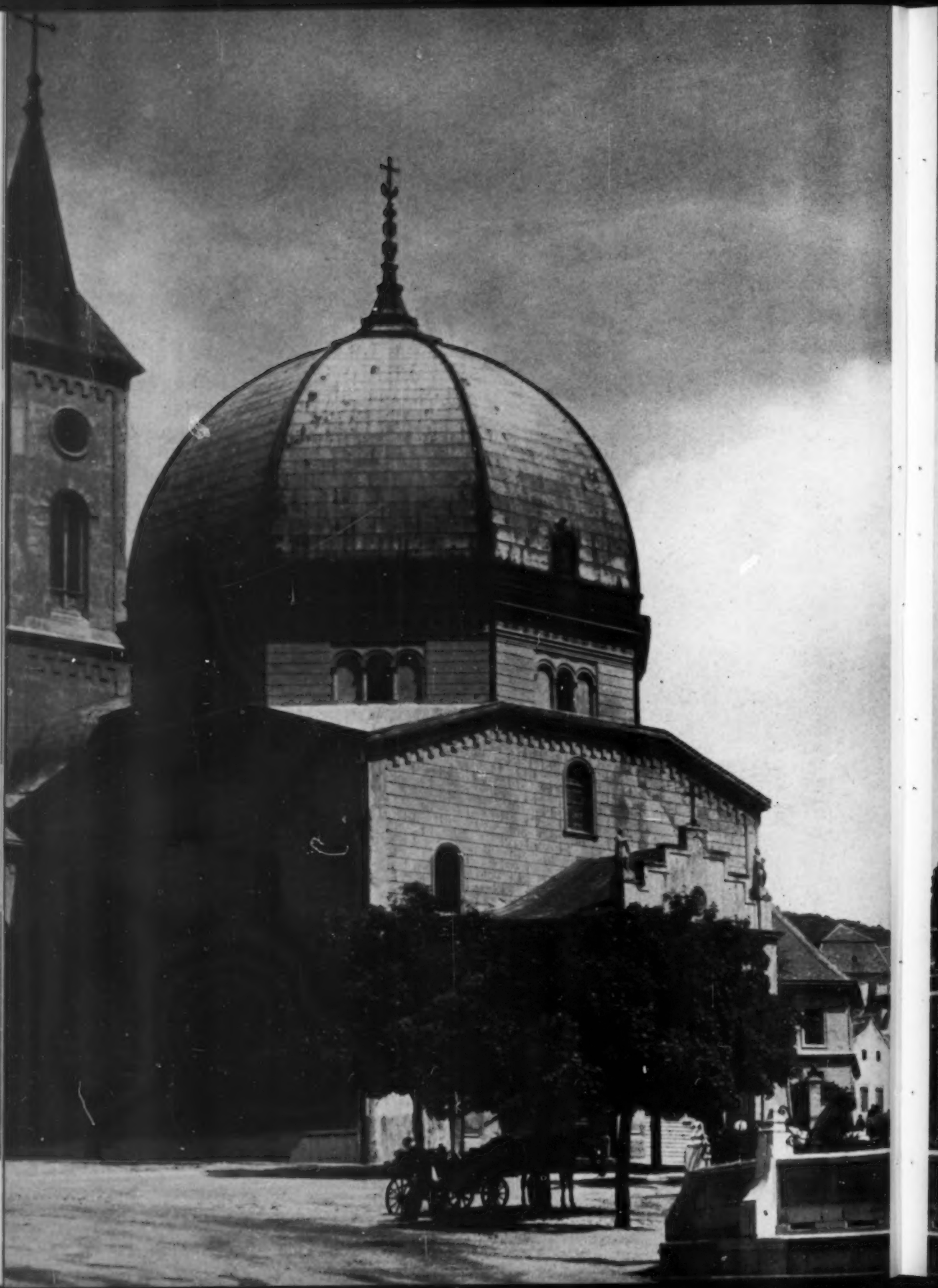




preparation building. Galvanizing plant, showing sheets passing through "pot." Piles of pig iron from blast furnace. (Centre group)—Open hearth furnaces set up for "tapping." Charging blooms into re-heating furnace (Algoma). Shipping department of 12-inch—10-inch merchant bar mill. Tapping an open hearth furnace (Algoma).



Steel ingot being rolled in the blooming mill of the Dominion Steel & Coal Corporation at Sydney, Nova Scotia, which has a capacity of 375,000 tons of steel blooms per annum.



HUNGARY

by DOMINIC C. DE SZENT-IVANYI

WHEN Shakespeare wrote his stirring lines about Britain, "the sceptred isle, the fortress formed by Nature for herself," he was anticipating the work of writers like Henry Buckle, who argued that ultimately the history of a country is determined by its geography. Whatever truth may be in this, there is no doubt that in the case of Hungary, geography has been the decisive factor in her history.

Hungary has (or had) perhaps the most remarkable geographical unity of all countries. It is a great prairie basin, watered by two great river systems (the Danube and the Tisza), and walled in by the curving ramparts of the Carpathian Mountains.

These facts decided the economic activities of the country. On the Great Plains there were farmers, and horse-men who were both breeders and riders. The fame of the Hungarian cavalryman, indeed, has given us many words, like "hussar"

The Bishopric of Pecs was founded in 1009, but the parish church was a mosque for over a century; for nearly 150 years (1543-1686) the city was possessed by the Turks. Note the cross superimposed upon the crescent.

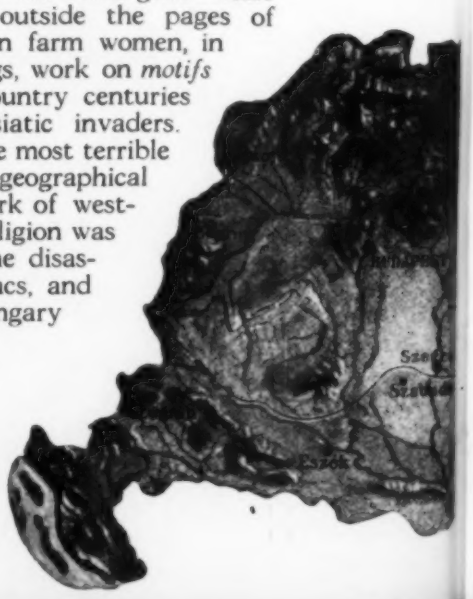
TOP—In 1001 A.D. Pope Silvester II recognized the Christian Monarchy of Hungary by the gift of a consecrated crown. This was combined with the royal crown to make the above Crown of St. Stephen, sovereign emblem of the Royal Hungarian State.

and "shako" which have to do with military horsemanship, as well as the full dress uniform of our light cavalry. On the uplands were woodsmen and trappers. Between them and the dwellers in the great plain there grew up an interesting economic relation; for in the spring the numerous mountain streams were swollen with the thaw of winter snows, and the mountaineers made great trains of long, narrow rafts, and sailed on them down to the plains. There they sold the winter catch of furs, and also the lumber from the rafts (a commodity greatly needed in the treeless plains), and then worked during the summer on the farms. In the fall they returned to their wooded highlands, and prepared for their next exciting journey into the interior.

But there were other geographical factors which had even greater results for Hungary. When Arpad and his Huns occupied the Danube basin about 900 A.D. they were quickly Christianized; and because fierce Asiatic tribes were still thrusting their blood-thirsty hordes into the West, Hungary became the outpost or bulwark of Christendom. During hundreds of years, and with varying fortunes, the brave Hungarians resisted the heathen invaders; and while nations farther west were consolidating their national life, Hungary was parrying the hammer-blows of the Mongols.

Out of defeat and victory there came for the Hungarians such strangely different things as national heroes, a Mongolian strain in both blood and speech, and oriental elements in Hungarian national art. The last named is to be seen in a number of public buildings, mosques for instance, dating back to the Asiatic occupation. Also, many of the traditional patterns of embroidery and peasant art are derived from the Mongols. Thus history lives on, outside the pages of books, as Hungarian farm women, in long winter evenings, work on *motifs* brought to their country centuries ago by ruthless Asiatic invaders.

In 1526 came the most terrible result of Hungary's geographical position: the bulwark of western culture and religion was battered down in the disastrous battle of Mohacs, and the boy-king of Hungary



Vying with the favourite poppies of Hungary is the dress of peasant women.

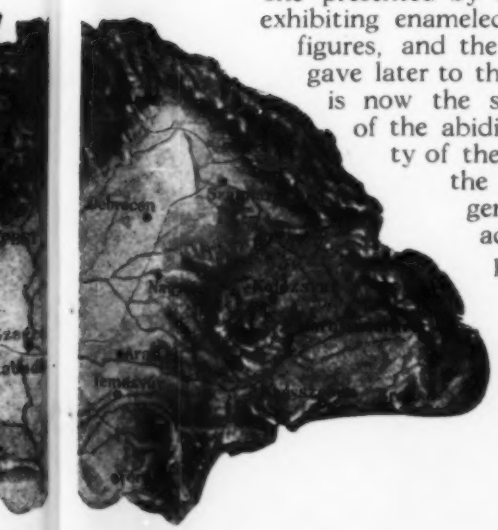
was drowned while attempting to escape from the victorious Asiatics.

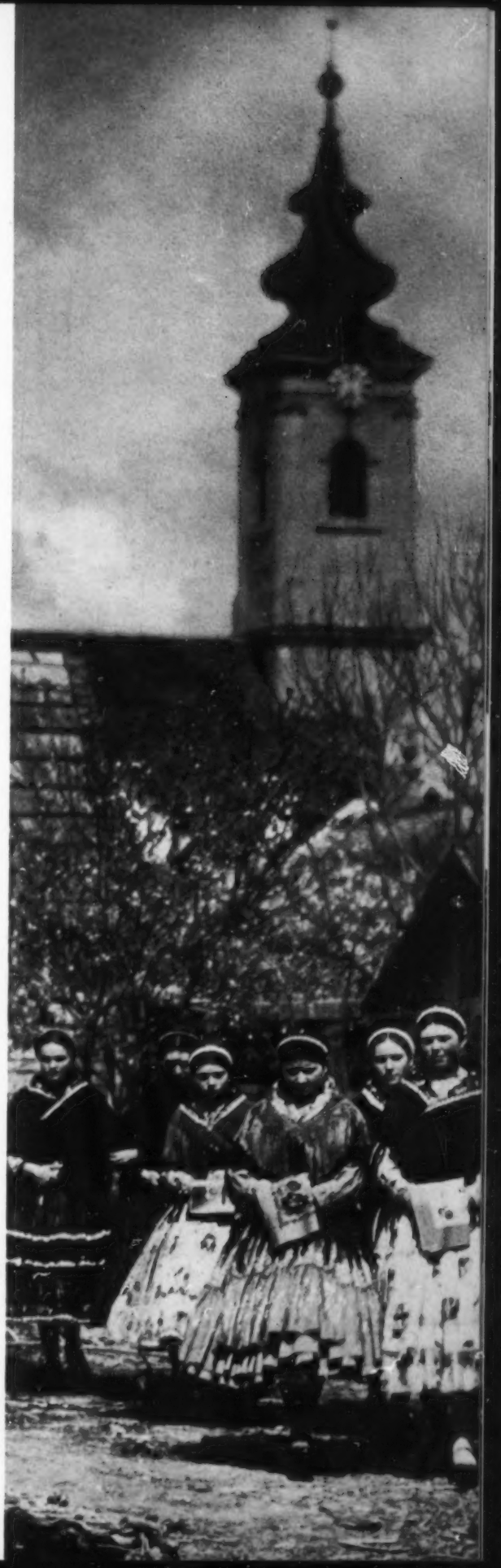
From then on Hungary suffered from both East and West. The orientals decimated her population and laid waste her cities; and a long, agonizing struggle to oust the invader left the country so weak that it was easily acquired by Austria. The new masters, however, found the indomitable spirit of the Hungarians was not to be wholly overcome by either defeat or oppression. Just as Hungary had maintained herself against the warlike Mongol tribes, so now she strove to retain her individuality against the domination of Austria.

Longer years of dissatisfaction culminated in the revolt of 1848, which Austria, with the aid of Russia, crushed mercilessly. But the Hungarians were not to be denied, and they eventually gained a measure of self-government in a dual-empire of Austria-Hungary, whose hyphenated title strikes a familiar memory in all whose schooling was prior to the Great War. Thereafter geography began to make itself felt again, and the remarkable physical unity of the Hungarian country contributed to its steady rise, which pointed to eventual domination over Austria.

Unfortunately, military conflict once again raised its ugly head, and in 1914 Hungary found herself an unwilling partner in the fortunes of the Central Powers. Defeat in the war was followed by the Treaty of Trianon. Hungary lost 71.5 per cent of her territory and 63.3 per cent of her population.

Since the exile of the Habsburgs, Hungary has been a kingdom without a king. The famous dual crown, so uniquely emblematic of the history and geography of the country, has become the mystic royal symbol. This crown is made up of the one presented by Greek Emperor Ducas, exhibiting enameled paintings of historic figures, and the other which the Pope gave later to the Hungarian king. It is now the symbol and repository of the abiding unity and continuity of the Hungarian state, and the personal head, or Regent, in theory merely administers for it. This plan is one of the most remarkable constitutional arrangements of all history.





Typical Hungary peasant costumes.

Four good friends promenade down the "main street," a view of typical Hungarian village of unpretentious peasant homes which are scrupulously clean. Inset:—Hungarian shepherds in characteristic dress.

Wheat harvest in the Alfold (Great Plain): except for the method, reminiscent of parts of Western Canada.

Proud horsemen, of legendary skill, the Hungarians still delight in a five-in-hand.

After the harvest: festivities which are immemoriably old. Note the piper and the gala dresses. Inset:—Characteristic shepherds of Bugac, wearing cloaks of unshorn sheepskin, discuss the latest news after their day's work is finished.

A farmstead on the Great Hungarian Plain. The long, low structure is characteristic; also the well, which may be seen reproduced in Western Canada.

A year's crop: colts on a horse-farm in the Great Plain.

On the far eastern extremities of the Alpine system, dominating the western approach to the Great Plain, lies Budapest (population 1,200,000), capital city of Hungary. The hills of Buda, the Danube, famous health springs, and beautiful architecture with historic and cultural associations make the city a memorable one.

Charlottetown Harbour, Prince Edward Island. The spires of St. Dunstan's Cathedral can be seen in the background.

PRINCE EDWARD ISLAND

"THE GARDEN OF THE GULF"

by **FRANK WALKER**

THE stolid aborigines had a feeling for its beauty when they called it "Abegweit," meaning Cradled-on-the-Wave. Jacques Cartier, who discovered it in 1534, noted in his journal that it was a land "low and plaine and the fairest that may possibly be seen, full of goodly meadows and trees." Many subsequent visitors, unconscious of plagiarism, have said the same thing. Others have been more poetical, but less accurate, in describing its points of charm. Its own people distinguish it from other islands by the prefix "the." They say "the Island" as a Highlander would say "the Maclean" in referring to the chieftain of that Clan. Rarely do they condescend to say Prince Edward Island, except when travelling on the unenlightened mainland.

Bronze tablet in the Confederation Chamber, Provincial Buildings, Charlottetown, commemorating the Fiftieth Anniversary of the Charlottetown Conference, September 1, 1864.

The smallest of Canada's provinces, the Island lies in a great semi-circular bay of the Gulf of St. Lawrence, which extends from Point Miscou in New Brunswick to Cape North in Cape Breton. From the mainland it is separated by Northumberland Strait, which varies from 9 to 30 miles in width. It is extremely irregular in shape, and deep inlets and tidal streams almost divide it into three approximately equal parts. From the head of Hillsboro River on the south to Savage Harbour (so called by Cartier) on the north is only one and a half miles, while at high tide the distance between the heads of the streams which fall into Bedeque and Richmond Bays is even less. The land nowhere rises to a height of more than 500 feet. The north shore, facing the Gulf, is a long series of beaches of fine sand, and is a favourite resort in summer. On the south, low cliffs of crumbling red sandstone face the Strait. The climate, says the Encyclopaedia Britannica, is "healthy, and though bracing, milder than that of the neighbouring mainland. Fogs are much less common than in either New Brunswick or Nova Scotia."

Less than 150 miles in length, embracing about 1,400,000 acres of intensively cultivated land, it was natural that this favoured spot should come to be known as "the Garden of the Gulf." Agriculture has been its main source of revenue for generations.

At first, it was its fisheries that attracted French settlers to Isle St. Jean, as it was formerly called. No permanent settlement was established until 1720, when Denys de La Ronde and Sieur de Gotteville de Bellisle choose the southwest side of what is now Charlottetown harbour as the site of Port La Joie—the administrative centre of the Island during the French regime, and the scene of many stirring incidents.

There was a steady migration from Acadia (Nova Scotia) to the Island until after the capture of Louisburg by the British in 1758. Then came tragedy. General Amherst sent Lord Rollo with four ships and 500 men to take possession, to destroy the settlement and to deport the population to France. On November 5 of that year, Admiral Durell reported that 2,000 had been embarked in sixteen transports and sent to France. On November 6, General Witmore reported 2,200 embarked. In addition to the 16 reported by Durell, seven other transports left Canso, Nova Scotia, with nearly 1,560 exiles. Of these, over 700 were drowned. The total

Photographs by courtesy of the Department of Trade and Commerce and National Parks Bureau.

TOP:—Brackley Beach, which extends from the mouth of Rustico Bay to Covehead Bay for a distance of over three miles, typifies the sandy beaches of which Prince Edward Island is justly proud.

CENTER:—Old Fort Edward Battery, 1841, Charlottetown, Prince Edward Island. Harbour and part of city in the background.

BELOW:—Oyster farmers, Malpeque Bay, P.E.I., culling "Seed" oysters reared from "Spat" on floating trays having wire net bottoms. When placed on trays oysters are ¼ to 1¼ inches, when planted later on beds, they measure approximately 1⅓ inches, to 2½ inches.

number deported is given by some historians as between 5,000 and 6,000. Seven years after the expulsion, Captain Samuel Holland, British surveyor-general, reported finding only thirty Acadian families in the very complete survey of every township he made in the Island. From these families are descended almost all of the 13,000 Acadians now living in the province.

The Island, as a British possession, remained under the Government of Nova Scotia until 1769, when it became a separate Colony, with Walter Patterson as its first Governor and Captain-General. In his despatches to the Earl of Hillsboro, Patterson summed up a long and interesting account of the Island's climate, its timber, game, and other resources, with the penetrating remark: "In short, my lord, if only the proprietors will exert themselves, this Island will, in a short time, be the Garden of America."

The proprietors, however, had no intention of exerting themselves. A few years before Patterson's arrival the whole Island had been parcelled into lots and disposed of to Court favourites in England by the simple process of balloting. The lots were granted in running numbers, as they were drawn. In this manner was foisted on the Colony a system of absentee landlordism which caused continual friction. The tenants could get little redress, and their grievances accumulated as the years went by. A bitter struggle ensued, which did not terminate until the Island entered Confederation in 1873, when the sum of $800,000 was advanced by the British Government, and the land was expropriated and finally passed into the hands of those who tilled it. Today, 95 per cent of the land of Prince Edward Island is freehold. Of its total population of less than 90,000, more than 78 per cent are engaged in farming.

Prince Edward Islanders derive almost entirely from pioneer French, English, Scotch and Irish stock. The waves of settlement under British rule occurred chiefly between the years 1770 and 1803, and included a contingent of Empire Loyalists, and three shiploads of Skye pioneers brought out by the Earl of Selkirk.

Absentee landlordism was not the only bone of contention in early Colonial days. Equally bitter was the struggle in Prince Edward Island for responsible government, which began with the Patterson regime in 1785 and continued until the formation of the Coles Government in 1857. The Executive Council then became wholly responsible to the Legislative Assembly, though the members of the Legislative Council continued to be appointed by the Government. In 1862 the Legislative Council also was made elective. Thirty years later, all this machinery of legislation was found too costly and cumbersome, and the two houses were combined into one house of thirty members, of whom one-half are elected by property holders, and the other half by property holders and franchise voters together.

The present political situation is unique in that all thirty members of the Legislature are of one party stripe—the Liberals, in 1935, having scored a 100 per cent victory at the polls over their Conservative opponents. The term of the Provincial Government, which is headed by the Honourable Thane A. Campbell, K.C., a former Rhodes Scholar, is limited by statute to five years.

No sketch of Prince Edward Island would be complete without reference to the historical significance of Charlottetown, the provincial capital, as "the Cradle of Confederation." It was here, on September 1, 1864, that the Confederation Fathers met for the first time. "Providence being their guide," says the tablet to their honour in what is now the Confederation Chamber—"they builded better than they knew." Originally called to discuss a Maritime union, the visit of delegates from Canada widened the Charlottetown Conference into a general conference on the federation of all the British North American colonies. The Quebec Conference, which met in the following October, adopted the basis of Confederation, but it was not until July 1, 1873, that Prince Edward Island entered the union and became a province of Canada. Financial difficulties connected with the building of an Island railway, and the offer of better terms by the Dominion Government, were determining factors in this result.

Down through the years, the Confederation Chamber in the Provincial Building at Charlottetown has been a magnet of interest to visitors. Care has been taken to preserve its historic features, including the very table and chairs used by the Confederation Fathers. It now contains a unique collection of relics of the Confederation period.

An episode which linked the Island with the American War of Independence may

here be related. On November 17, 1775, two American privateers, with crews of eighty men each, raided Charlottetown, and after plundering the town sailed away to General Washington's headquarters at Winter Harbour. They took with them as prisoners the Acting-Governor and the Surveyor General. Amongst their loot was the Island's official silver Seal and its Governor's Royal Commission. It is pleasant to record that the leaders of this expedition were rewarded by dismissal from their commands, and that due apologies were tendered by Washington for the outrage committed. The Governor's Commission, which was returned, was rediscovered lately among some old documents in the Provincial Building, and is now in the archives.

Prince Edward Islanders have reason to look forward with optimism. They have created new industries in certified seed potato production and silver fox breeding which have given the Province an international reputation. But the backbone of Island industry continues to be mixed farming. Dairying has been followed successfully for upwards of 150 years, and some of the finest herds in Eastern Canada are to be seen in Island pastures. A large export business is carried on in bacon, poultry, and other farm products.

To the late Honourable Charles Dalton, Lieutenant Governor of Prince Edward Island, the world is chiefly indebted for the fur farming industry. Dalton began breeding foxes in captivity as early as 1887. By 1909 a number of Island farmers were engaged in the industry. During the years immediately following, speculation ran riot and prices of breeding stock soared to as high as $35,000 a pair. The boom crashed during the Great War, ruining many people. But within a few years the industry was re-established on a sounder basis, and its present development to one of world importance is likely to prove permanent. Prince Edward Island continues to be a centre of the silver fox industry, a large percentage of its farmers being fox ranchers in a small way.

The fishery industry—next to farming, Prince Edward Island's most important revenue producer—is struggling precariously under the handicap of restricted markets and low prices. But the quality of the product remains, what it has always been, a unique asset. The flavour of Island lobsters and oysters is unsurpassed anywhere. The Province's oyster areas, once famous and flourishing, are being rehabilitated after a long period of sterility.

As may be inferred, Prince Edward Island is a region of great attraction for the tourist, and the development of the tourist trade is a logical sequence. The charming pastoral countryside, congenial climate, and sea-coast attractions are rapidly gaining favour not only with Canadians but with visitors from other countries as well. The establishment of Prince Edward Island National Park in 1936 by the Dominion Government ensured the preservation as a national heritage of some of the finest sand beaches on the Island, and also called to public attention the magnificent recreational attractions of this sea-side province.

The new park, which embraces an area of approximately seven and a half square miles, extends along the north shore for a distance of nearly twenty-five miles. It includes such well known beaches as Rustico, Brackley and Stanhope, which in many places have backgrounds of rolling sand dunes or picturesque red rocks worn into unusual formations by the sea. The park also includes Green Gables, situated in the Cavendish region, and made famous by the writings of Lucy Maud Montgomery. Located near this tourist shrine is the "Lake of Shining Waters," also portrayed in the novel, "Anne of Green Gables." As time goes on, orderly development will be carried out, including the provision of facilities for accommodation and recreation, and the new park may be expected to become one of the outstanding vacation areas in Eastern Canada.

The customary way to reach the Island is by way of Sackville, New Brunswick, a point on the main line of the Canadian National Railways. From here a railway, 35 miles in length, runs to Cape Tormentine on the Northumberland Strait. Transportation between this point and Port Borden, on the Island, is by a luxurious Dominion Government ferry steamer which carries railway freight cars, baggage, mail and express cars as well as automobiles and passengers. This furnishes a service twice daily, except Sunday, throughout the year, linking the Province with the mainland lines and affording direct connections with trains from Halifax, Montreal, St. John, Boston and New York. Pullman sleepers are available. Paved roads between Borden and Summerside and Charlottetown, which will likely be extended shortly to other centres, have proved a boon to visiting motorists.

A section of Queen Street, Charlottetown, historic capital of Prince Edward Island.

Charlottetown is characterized as "The Cradle of Confederation." We see here the Legislative Buildings and Customs Building where the conference on the federation of all the British North American colonies took place in September 1864. Inset—"Confederation Chamber."

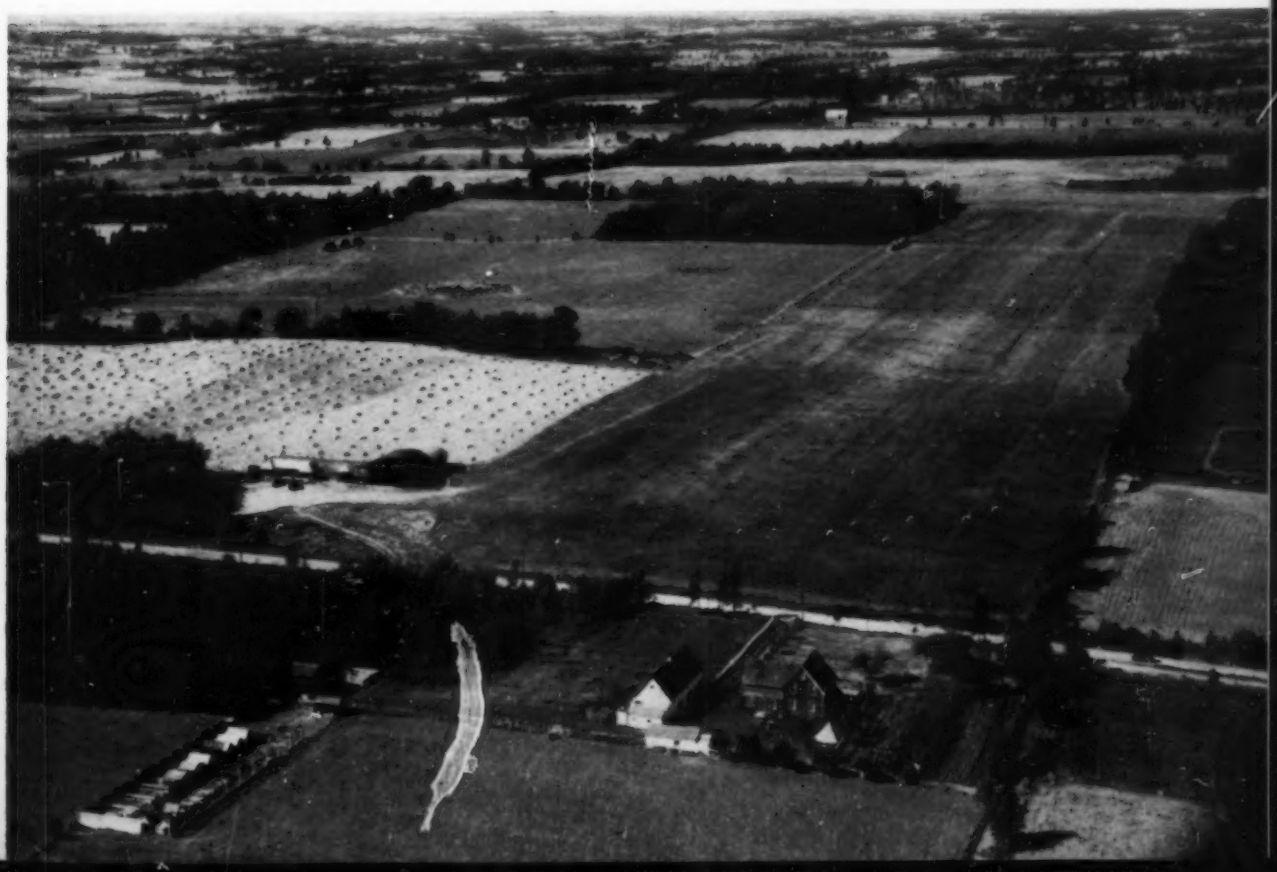
This charming pastoral scene at St. Catherines, near Charlottetown, is characteristic of the undulating nature of the Island.

A potato field in blossom, Dominion Government Demonstration Station, Rustico, P.E.I.

A farm home, Lower Newtown, Prince Edward Island.

Upton Airport and environs, Charlottetown, P.E.I. This region of intensive cultivation, characteristic of the Island, is further enhanced by the colourful roads occasioned by sandstone and red clay shale overlaid with red sandy loam soil.

Canadian Airways



Beach Grove Inn and environs, near Charlottetown.

Thirty miles long, the Khyber Pass cuts through otherwise unpassable mountains on the frontier of India's North West Province and Afghanistan. British troops perpetually guard this great highway of commerce against the attacks of fierce frontier tribes.

In the Khyber Pass, too . . .

Ceaseless vigilance is the rule in "The Pass" . . . on guard against ambush. Watching, watching . . . through monotonous days and nights.

Here, Gold Flake Cigarettes also play their part by giving smokers satisfying relief from strain. How could it be otherwise! *This* cigarette—with its "Top Grade" Virginia leaf and pure white Velin paper—has a distinctive personality and flavour all its own! You, too, like so many other Canadians, will prefer Gold Flakes because they are well and firmly made, just as you like them.

W.D. & H.O. WILLS' **GOLD FLAKE**

Plain or Cork Tip **CIGARETTES**

A Shilling in London—a quarter here

Tins of 50 - 55¢

The Canadian Geographical Society

OTTAWA, CANADA

HONORARY PATRON:

His Excellency the Right Honourable LORD TWEEDSMUIR, G.C.M.G., C.H.
Governor-General and Commander-in-Chief of the Dominion of Canada.

J. B. TYRRELL, M.A., LL.D., F.G.S., Honorary President. A. P. COLEMAN, M.A., Ph.D., F.R.S., Honorary Vice-President.

BOARD OF DIRECTORS:

CHARLES CAMSELL, C.M.G., B.A., LL.D., President

CHARLES G. COWAN, Vice-President
MAJOR-GEN. A. G. L. MCNAUGHTON, Vice-President
LT.-COL. G. L. P. GRANT-SUTTIE, Vice-President
HON. W. A. BUCHANAN, Vice-President
R. C. WALLACE, Vice-President
O. M. BIGGAR, K.C., Honorary Counsel
K. G. CHIPMAN, Honorary Treasurer
E. S. MARTINDALE, B.A.Sc., Honorary Secretary

HON. A. E. ARSENAULT, Assistant Judge, Supreme Court, Charlottetown, P.E.I.
MARIUS BARBEAU, National Museum of Canada, Ottawa, Ontario.
ARTHUR BEAUCHESNE, Clerk of the House of Commons, Ottawa.
HON. H. V. BIGELOW, Regina, Sask.
F. E. BRONSON, President and Managing-Director, The Bronson Company, Ottawa.
LAWRENCE J. BURPEE, Secretary for Canada, International Joint Commission, Ottawa.
G. J. DESBARATS, Ottawa.
COL. W. W. FOSTER, Vancouver, B.C.
K. A. GREENE, Ottawa.
F. C. C. LYNCH, Department of Mines and Resources Ottawa.
C. J. MACKENZIE, Dean, University of Saskatchewan, Saskatoon, Sask.
L. T. MARTIN, Ottawa.
DUNCAN MCARTHUR, Deputy-Minister, Department of Education, Toronto, Ont.
LT.-COL. SIDNEY C. OLAND, Halifax, N.S.
JAMES A. RICHARDSON, Winnipeg, Man.
H. M. SNYDER, Montreal.
E. J. TARR, K.C. Winnipeg, Man.
GRIFFITH TAYLOR, University of Toronto, Toronto, Ont.
J. C. WEBSTER, Shediac, N.B.
J. A. WILSON, Controller of Civil Aviation, Department of Transport, Ottawa.

Editorial Committee:

Hon. W. A. BUCHANAN, Lethbridge, *Chairman*
MARIUS BARBEAU, Ottawa
GORDON M. DALLYN, *Secretary*
LT.-COL. G. L. P. GRANT-SUTTIE, Toronto
F. D. L. SMITH, Toronto
OLIVER MASTER, Ottawa
N. A. ROBERTSON, Ottawa
F. C. C. LYNCH, Ottawa
W. EGGLESTON, Ottawa

Executive Secretary:

GORDON M. DALLYN

The Society's ambition is to make itself a real force in advancing geographical knowledge, and in disseminating information on the geography, resources and peoples of Canada. In short, its aim is to make Canada better known to Canadians and to the rest of the world.

As one of its major activities in carrying out its purpose, the Society publishes a monthly magazine, the Canadian Geographical Journal, which is devoted to every phase of geography—historical, physical and economic—first of Canada, then of the British Empire and of the other parts of the world in which Canada has special interest. It is the intention to publish articles in this magazine that will be popular in character, easily read, well illustrated and educational to the young, as well as informative to the adult.

The Canadian Geographical Journal will be sent to each member of the Society in good standing. Membership in the Society is open to anyone interested in geographical matters. The annual fee for membership is three dollars in Canada.

The Society has no political or other sectional associations, and is responsible only to its members. All money received is used in producing the Canadian Geographical Journal and in carrying on such other activities for the advancement of geographical knowledge as funds of the Society may permit.

EDITOR'S NOTE BOOK

Mr. Desmond Killikelly, author of the article in this issue on "The Steel Industry of Canada," is assistant to the vice-president of The Steel Company of Canada, Limited. He is well qualified to trace the past and present progress of steel production, having been associated with the industry for many years, and is much interested in research. Mr. Killikelly was born in Grenada, British West Indies, and went to the United States in 1896, joining the Carnegie Steel Company, which was later absorbed by the United States Steel Corporation. On coming to Canada he became connected with the Montreal Rolling Mills Company, Limited, now a subsidiary of The Steel Company of Canada, and in 1919 was appointed chief inspector of the Montreal Works. Mr. Killikelly is much interested in national and international affairs, concerning which he has delivered a number of addresses.

Dominic C. de Szent-Ivanyi, who writes on Hungary in this issue received the degree of Doctor of Philosophy from the University of Budapest. He attended the Sorbonne, was assistant in geography to Count Paul Teleki, sometime Premier of Hungary and a distinguished geographer, famous for his classic work on the Cartography of Japan. Dr. Szent-Ivanyi specializes in Historical Geography, and has travelled widely both in Europe and America.

Readers of the Journal will find in the June issue a variety of interest in such subjects as "Adventures in Bird Photography" by P. A. Travener and Hoyes Lloyd, well known authorities on this subject, "The Saguenay Country" by Dr. Marius Barbeau, "Trips to America Before the Time of Columbus" by Pierre Mornand, and other illuminating articles.

The Editorial Committee is sparing no effort to secure the best authoritative and interesting material dealing with Canada's wealth of geographical subjects, and to present this in graphic pictorial form designed to interest all members of the family in their geographical heritage.

Under the auspices of the Society four lectures have been delivered before Ottawa members and their friends during the past winter. His Excellency, the Governor General, Honorary Patron, honoured the Society by his presence at three of the addresses, while Her Excellency the Lady Tweedsmuir, attended two of the lectures.

The March issue contained a brief account of Mr. Harry Snyder's lecture, which dealt with his exploration in Canada's little known Northwest Territories.

Mr. Edward Shackleton, leader of the Ellesmere Land party of an expedition last year into the Northern Arctic, organized under the auspices of the Oxford University and the Royal Geographical Society, outlined his explorations in these hitherto untrodden sections of the most northerly land, not only in Canada, but in the British Empire. Readers may look forward to an article by Mr. Shackleton in an early issue of the Journal.

Mr. Bradford Washburn, well known mountaineer and explorer, addressed members of the Society last month on the subject of the Lucania Expedition of 1937. An account of this expedition with data and photographs supplied by Mr. Washburn is in the course of preparation and will be published in the Journal at an early date.

The fourth lecture, which proved of great interest to Ottawa members, was delivered by Richard Finnie, widely known as a student of the Far North. A brief account of his lecture, "Patrol to the Northwest Passage," is published in this issue. Readers will also be interested in knowing that an article with many of Mr. Finnie's photographs will shortly appear in the Journal.

Arrangements are under way whereby it is hoped this autumn to have lectures delivered for the benefit of members of the Society in some of the larger centres of Canada.

AMONGST THE NEW BOOK

Limits of Land Settlement, prepared under direction of Isaiah Bowman, President of John Hopkins University (Council of Foreign Relations, 45 East 65th Street, New York City, 1937, $3.50). Just at this time when international discontent in many cases is blamed on popu.ation pressure in overcrowded lands, students of political geography should welcome this extremely informative volume by Dr. Isaiah Bowman and collaborators, who present an account of settlement possibilities and population capacity in the principal undeveloped frontier areas of the world. In the volume, the individualities of the several regions and the points of view of each author has been preserved by each having been permitted to prepare his account largely in his own way.

(*Continued on page XI*)

PATROL TO THE NORTHWEST PASSAGE

Résumé of lecture delivered by Mr. Richard Finnie on March 21st in the Victoria Memorial Museum, Ottawa, under the auspices of the Canadian Geographical Society.

Since the dawn of the fifteenth century, merchant princes of Europe had been stirred by stories of fabulous wealth in Cathay and India and, as a realization that the earth was round became more widely appreciated, visions developed of vessels bearing jewels and spices from out of the Western Ocean making their appearance over the western horizon. Mariners set forth to pioneer the new route, Columbus, Cabot, Corte-Real and Cartier among them, but their way was barred by a vast continent. One of these explorers thought he had reached China, however, on his arrival at what is now known as Lachine.

Still, some opening to the vast expanse of the South Sea must exist, in their opinion, and so began a search for the Northwest Passage. Ship after ship set forth with pioneers whose names are perpetuated in Canada's north country: Baffin, Davis, Frobisher and Hudson; yet all returned without having forced their way through the mass of ice and barren rocks of the Arctic. Following Parry, Ross, Franklin, McClure, Kellett, McClintock and Sverdrup, Amundsen set sail in 1903 for Bering Sea in a small ship, the Gjoa, entering the Arctic Ocean from the west. Three years later he emerged into the Atlantic through Lancaster Sound, having found the Northwest Passage by way of Dolphin and Union Straits, Coronation Gulf, Dease Strait, Simpson Strait and Franklin Strait.

Orders were issued in 1928 by the Hudson's Bay Company in London for the ninety-five-ton motor schooner Fort James to sail north from St. John's, Newfoundland, and to retrace the course followed by Amundsen. She reached Gjoa Haven, on King William Island and close to the Magnetic North Pole, where she spent two winters. Here she was joined by the Fort Macpherson, from the Western Arctic, completing in effect the second transit of the Northwest Passage. The Fort James returned to her normal duties of delivering supplies to posts in the Eastern Arctic, and in 1934 again set sail from St. John's. This time she was bound for the Western Arctic, but not by way of the Northwest Passage. Amundsen took three years, and it was necessary that the Fort James should reach the mouth of the Mackenzie River in time to make delivery of supplies that summer, So, she went via the Panama Canal, and reached Cambridge Bay, some two hundred miles to the west of Gjoa Haven, where she had spent two winters. Another epic of the sea was written into nautical records!

The above is a preamble to the story told by Mr. Finnie, illustrated by an excellent film taken by himself last summer and produced by the Department of Mines and Resources. The R.M.S. Nascopie, of the Hudson's Bay Company, extended her normal itinerary during the past summer, sailing through Lancaster Sound and south into Prince Regent Inlet, where she lay off Bellot Strait, on the threshold of the Northwest Passage. Here, on September 2nd, contact was made with the motor schooner Aklavik, which had followed the route taken by Amundsen from the Western Arctic. Mails and supplies were transferred from the Nascopie, the historical occasion was duly celebrated, and departure was taken for their respective destinations at either side of a vast continent. A new trading post, perpetuating the name of a great explorer and known as Fort Ross, was established on Somerset Island. The building was quickly erected, a post manager installed and adequate supplies provided for the development by Eskimo trappers of a new territory in Canada's Arctic lands.

Countless illustrations were given by Mr. Finnie of the manner in which the "frozen north is being defrosted," the native inhabitants quickly assimilating many of the ideas and conveniences of modern civilization. The Arctic white fox is the principal means of livelihood in the Far North, the pelt of this animal being the medium of exchange at trading posts. Polar bears and seal provide fresh meat, and nourishment is also obtained from the Arctic char.

Craig Harbour, at the southern end of Ellesmere Island, and the most northerly post office in the British Empire, handles considerable mail during the annual visit of the Nascopie, philatelists from all parts of the world being responsible for more than four thousand pieces of mail being date-stamped at this post, whose administrative area extends over 75,000 square miles.

When in Churchill, at the northern extremity of the Hudson Bay Railway, three other vessels were in port. These included *H.M.S. Scarborough*, of the America and West Indies Squadron, which was making the first visit of a British man-o'-war to Hudson Bay in many years. Although her crew made no attempt to capture the elevator, they were shown engaging in sham combat over the adjoining barren lands. The *S.S. Wentworth* arrived in Churchill with a cargo of British coal, and planned to load grain out, together with the *S.S. Jean L.D.* It was expected these two ships would empty the elevator, and no arrivals were contemplated for 1938 to take on a grain cargo.

The film produced by the Department of Mines and Resources, and given its premiere on March 21st, illustrated the importance of providing for the welfare of Canada's northern residents. Although they appeared happy, contented and in good health, hospital attention is available at Pangnirtung, in Cumberland Sound, Baffin Island. The Royal Canadian Mounted Police also render considerable assistance to the natives on their long patrols by dog sled. Administration is undertaken by this force over a wide area that may contain considerable wealth in undisclosed mineral resources, and may prove an invaluable asset to the Dominion with the further advance of aviation.

J. FERGUS GRANT.

AMONGST THE NEW BOOK

(*Continued from page V*)

The authors suggest that migration is no answer to social and economic strain induced by so-called overpopulation, nor does military conquest provide a practical or rational answer, since additional empire rarely furnishes an offset to a high birth rate. It is stated that no apparent nor predictable stream of migration can keep up with the birth rate of conspicuously overcrowded countries. The military conquest of Ethiopia may not furnish an outlet for Italy's surplus population which is being rapidly augmented by Mussolini's demand for more and larger families. Nor is Japan's invasion of China likely to solve the problem of unrest in that country, as the Japanese have not yet demonstrated their ability as good colonizers of the colder climates, and the more southerly regions of China are already overpopulated.

Times have changed. Unless settled in military groups, subject to rigid supervision, the present settler is unable to cope with changed environment. He wants all or nearly all of the comforts of the area from which he migrated, even if he did not possess them in that locality, such as assistance in clearing land, free seed, telephones, railroads, medical assistance, the same diet, religion and technological assistance, a favourable climate and an easily accessible market. The best settlers, and the most natural ones are those who have accepted advice and information from friends in the country to which they intend to migrate, and this type of settler is welcomed in most countries to share in the development of its natural resources at as rapid a rate as seems desirable both for the country and for the settler.

The volume contains chapters on the prospect for redistribution of population, the food supply in the migration process, possibilities of migration and population factors in Canada, Soviet Russia, Australia, Africa and South America, the mainsprings of Asiatic migration and the migration and colonization of the Chinese and Japanese peoples.

The book is very readable and provides a valuable and authoritative survey of conditions and settlement on the undeveloped areas of the world.

D. A. NICHOLS.

"A knowledge of the history of one's community provides the understanding approach to the study of our country's history and brings the record to life." So conceudes the introduction to the *History of Weston*, by F. D. CRUICKSHANK and J. NASON (Weston: Times and Guide, 1937). This little book of one hundred and sixty-two pages is a discursive story of the town of Weston from its foundation as a little village on the banks of the Humber in 1792 to the present time. Descendants of the fine old pioneers who first came to this attractive region to build its mills, houses, schools and churches and laid the foundations of the many worthy traditions will revel in these records. The authors, whose forebears served Weston for several generations, have gathered their material from many sources and produced a valuable historical document. Weston has twice figured in the publishing world during the past year. Readers may recall the charming biography of William Tyrell of Weston, reviewed in the March number of this Journal.

FLORENCE E. FORSEY

THE PROMOTION of

Goodwill Through Understanding

is one of the main objectives of The Canadian Geographical Society.

The Canadian Geographical Journal, published by the Society, features the portrayal, in graphic manner, of Canadian life and backgrounds.

Membership in the Society, donated to friends within our borders and across the seas, and to our neighbours to the South, is recommended to our members as an appropriate Remembrance Gift that will serve to promote effectively the aims and objects of the Society.

THE CANADIAN GEOGRAPHICAL SOCIETY

Brock Building . . . 172 Wellington Street . . . OTTAWA, CANADA

WORDS SEEM SO SMALL

The Athabaska Glacier—on the NEW and impressive Columbia Icefield Drive.

Yes, words seem small—inadequate—in picturing the marvellous beauty that is Jasper . . . a National Park of 4,200 square miles of Nature unspoiled . . . where the massive Columbia Icefield is but one of the many spectacular features. Majestic mountain scenes . . . interesting wild animal life . . . and exhilarating outdoor sports, vie for the attention of Jasper's guests.

Jasper is a spot that all Canadians should see—for it takes its rightful place in the first rank of natural beauty in all the world.

The snowy cap of Mt. Edith Cavell juts into clouds which are seemingly held aloft by her inspiring height.

•

Rates at Jasper Park Lodge are surprisingly low—from $7 a day, including meals. Accommodation, 650 guests.

•

Ask any Canadian National Agent for descriptive booklet and full information regarding low Coach, Tourist and Standard fares.

JASPER NATIONAL PARK *in the Canadian Rockies*

CANADIAN NATIONAL

TO EVERYWHERE IN CANADA